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This chapter describes the process of valuing residential dwelling units. It begins with an overview of the data collection procedure for dwelling units. In order to understand the process of valuing residential dwelling units, you need to understand the following concepts, which are described in this chapter:

- measuring and calculating floor areas for dwelling units
- determining the story description for dwelling units
- categorizing a dwelling unit's garage or carport
- labeling the sketch of a dwelling unit.

The rest of the chapter provides step-by-step instructions for completing the relevant sections of the Residential Property Record Card and for determining the true tax value for a dwelling unit.

Overview of the Data Collection Procedure

When gathering data to assess a residential dwelling unit, you need to

- gather general information with the occupant's assistance, if possible
- gather information about the interior
- take the necessary measurements
- assess the general characteristics
- review the data before you leave.

The steps below describe a recommended approach for performing each of these tasks. The section *Completing a Property Record Card* in this chapter provides detailed instructions for completing each area of the Property Record Card when assessing a dwelling.

Task 1—Gathering General Information

Step 1 Record the address of the dwelling and check the exterior components, such as the foundation, walls, and roof.

Step 2 Greet the occupant, present an identification card, and explain the purpose of the visit in a brief, courteous manner.

If the occupant is not there, estimate the interior information.

If the occupant refuses to admit you to the property, do not argue. Leave immediately and estimate the assessment data. Note on the card that admittance was refused, and record the date and time.

Step 3 Determine the age of the dwelling. If the occupant does not know, estimate the date of construction and indicate the date estimated with a +/- after the date.

Step 4 Determine the number of rooms per floor, the total number of bathrooms, and whether there is a basement and/or an attic.

Step 5 *If there is a finished attic, determine the extent of the finish.*

Task 2—Gathering Information About the Interior

- Step 1 *If the dwelling is more than one-story*, inspect the upper floor to determine the extent to which it is finished.
- Step 2 Note the quality of construction and other features that affect the determination of grade, such as the quality of each aspect of the interior finish.
- Step 3 Note the general condition of the dwelling for the determination of depreciation. For example, look for signs of wear and tear, as well as deterioration, such as cracked walls and sagging floors.
- Step 4 *If there is a basement*, determine its size and whether there are any improvements, such as installation of extra plumbing fixtures or creation of a recreation room. If areas are finished, evaluate the quality of the finish and size of the finished area. While in the basement, determine the size and type of floor joists.
- Step 5 *If there is a crawl space*, determine the size.
- Step 6 Determine the type of heating and the number of plumbing fixtures.
- Step 7 Double check the interior features noted on the property record card. Be sure to note any unusual conditions that are not visible from the outside, such as recent remodeling or severe deterioration of the interior. Remember to mark the card clearly so the feature can be priced properly.
- Step 8 *If you have no further questions*, thank the occupant and begin your exterior inspection.

Task 3—Measuring the Dwelling

- Step 1 Measure the dwelling and sketch it neatly on the property record card in its approximate proportions. Also,
- Be sure the measurements are complete and accurate.
 - Note any offsets or additions.
 - Indicate separate story heights and show additions to the base of the dwelling.
 - Indicate the location of any basement and crawl space.
 - Make sure that the total measurements of opposite sides are equal.
- Step 2 *If the dwelling has any exterior features such as a porch, deck, patio, or balcony*, indicate the dimensions in the sketch area and label the improvement.
- Step 3 Provide information about the garage.
- If there is an attached carport or garage*, indicate the type of construction, story height, and area inside the sketch area of the property record card.

If there is a detached garage, enter its measurements in the appropriate blocks on the card. Note whether the grade and condition of the garage are similar to the dwelling.

If there is a basement garage or integral garage, label its car capacity or area, if possible.

If the dwelling does not have a garage or carport, note this fact on the property record card.

Task 4—Assessing the General Characteristics of the Dwelling and Neighborhood

Step 1 From the beginning of your review, establish an idea of the proper grade. See Appendix A, *Assigning Grades to Dwellings*.

Step 2 Determine the property condition rating for the dwelling. This rating is a judgment of the physical condition and functional usefulness of the dwelling in relation to other properties in the neighborhood. See Appendix B, *Understanding Property Condition Ratings*.

Step 3 Before you finalize your determination of the grade for the dwelling, go to a position where there is a good overall view of the dwelling. Then, determine the grade based on your inspection of the dwelling in addition to the procedures identified in Appendix A.

Note: The pricing schedules do *not* reflect added cost for the increased perimeter of an irregular wall outline, expansive roof structures with wide overhangs, and elaborate trim and built-in features. The grade factor is used to reflect these attributes, as well as other factors.

Step 4 Determine the total depreciation of the dwelling. Total depreciation for residential property is obtained by reviewing the grade, property condition, and age. Information about determining depreciation is provided in Appendix B.

Task 5—Reviewing the Data

Before you leave, be sure to review all the data about the dwelling to ensure that it is complete and accurate.

Measuring and Calculating Areas

Use the following guidelines to determine the base area of the dwelling unit:

- Measure the exterior of each full or partial floor, but do not include measurements for exterior features such as porches and stoops.
- Enter all measurements on the sketch area of the Property Record Card.

- Check the front measurements against the rear measurements, and the side measurements against each other.
- Compute the base area of all units while at the site to avoid missing a measurement.

Figure 3-1 and the example that follows show how to calculate the base area for a dwelling.

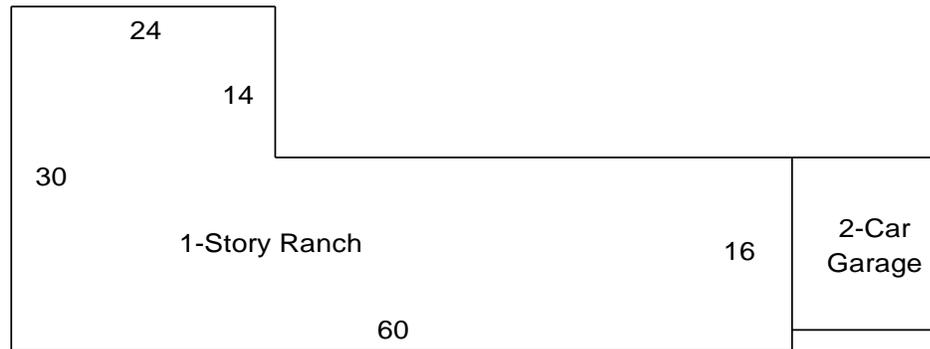


Figure 3-1. Floor Plan

Example: $16' \times 60' = 960$ sq. ft.
 $14' \times 24' = +336$ sq. ft.
 1,296 sq. ft. of ground floor area

Use the following guidelines when making a sketch of the dwelling:

- Sketch the dwelling neatly on the card in its approximate proportions.
- Separate the segmented areas of the dwelling based on the presence of different story heights and/or the presence of a basement and crawl space mixture.
- Record on the sketch each measurement of the dwelling rounded to the nearest 1 foot.
- Write each measurement horizontally and as close to the corresponding line as possible.
- Check the total of the front measurements against the total of the back measurements of the dwelling.
- Check the total of the side measurements against the total of the opposite side measurements.
- Record the sizes of any exterior features or attached garages.

Figure 3-2 shows the correct and an incorrect way to enter measurements on the card.

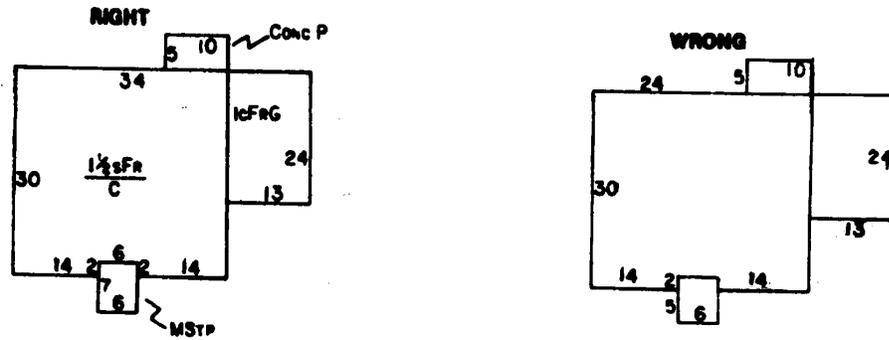
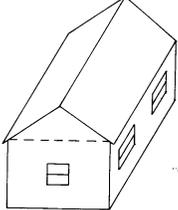


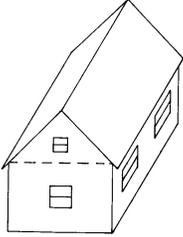
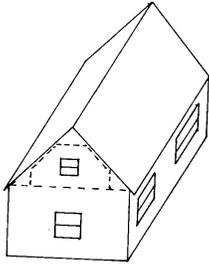
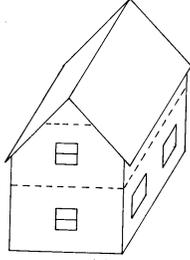
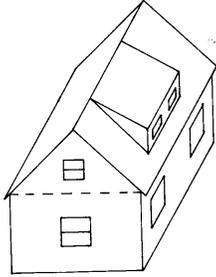
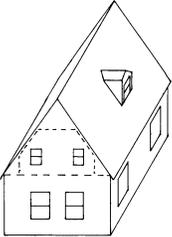
Figure 3-2. Measurements

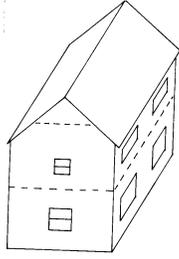
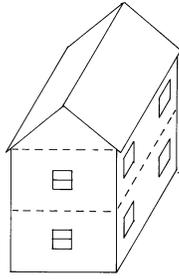
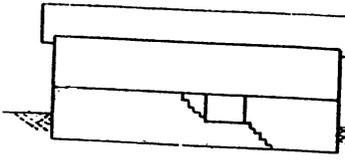
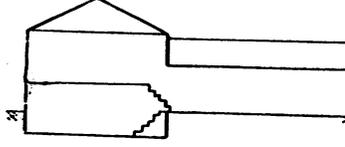
Determining the Story Description

The base residential cost schedules used to calculate the replacement cost of a dwelling are listed by floors. Use the explanations in Table 3-1 to determine which story description is appropriate for a dwelling.

Table 3-1. Story Descriptions

Story Description	Figure
<p>One-story dwelling, generally referred to as a ranch style home, has the following characteristics:</p> <ul style="list-style-type: none"> ■ all rooms on one floor ■ all rooms located below the square of the house at the eave line ■ low-pitch roof with a slope of about 1/6. 	

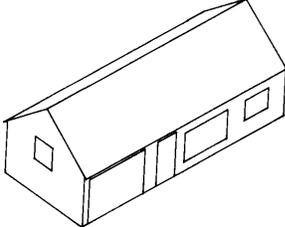
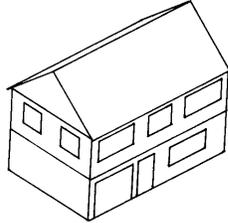
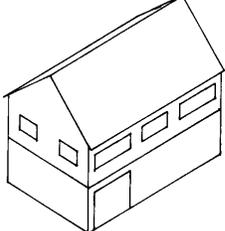
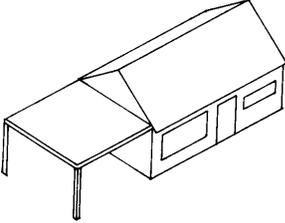
Story Description	Figure
<p>One-story dwelling with an attic has the same characteristics as a one-story dwelling, and also has the following characteristics:</p> <ul style="list-style-type: none"> ■ a roof slope of about 1/4 or 1/3 ■ permanent stairway to a usable, floored attic. 	
<p>One-story with a finished attic has the same characteristics as a one-story dwelling, and also has the following characteristics:</p> <ul style="list-style-type: none"> ■ a roof slope of about 1/4 or 1/3 ■ permanent stairway to an attic with interior finish. 	
<p>One and one-half story has the following characteristics:</p> <ul style="list-style-type: none"> ■ full first floor area and a full second floor area ■ usable second floor area less than the first floor area ■ second floor exterior wall height of 4 or 5 feet ■ second floor ceiling follows the slope of the roof. 	
<p>One and one-half story has characteristics similar to those of a one-story dwelling with a finished attic, and also has the following characteristics:</p> <ul style="list-style-type: none"> ■ a roof slope of about 1/3 to 1/2 ■ large dormer on one side of the roof, and may have 1 or 2 smaller dormers on the opposite side of the roof. 	
<p>One and one-half story has characteristics similar to those of a one-story dwelling with a finished attic, and also has the following characteristics:</p> <ul style="list-style-type: none"> ■ high-pitch roof with a slope of about 5/8 or 3/4 ■ small dormers on one or both sides of the roof. 	

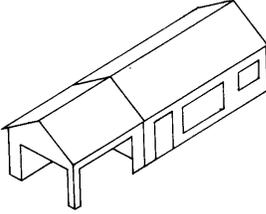
Story Description	Figure
<p>One and three-fourths story has the following characteristics:</p> <ul style="list-style-type: none"> ■ full first floor area ■ second floor exterior wall height of 6 or 7 feet ■ part of the second floor ceiling follows the slope of the roof. 	
<p>Two-story has the following characteristics:</p> <ul style="list-style-type: none"> ■ two full floors of living area ■ first floor usually at grade level. 	
<p>Bi-level has the following characteristics:</p> <ul style="list-style-type: none"> ■ 2-level design ■ first floor partially below grade ■ entry or foyer at a level between the first and second floor. 	
<p>Tri-level has the following characteristics:</p> <ul style="list-style-type: none"> ■ split-level design of 3 levels or more, exclusive of any basement ■ first floor partially below grade and partially at grade level ■ second floor on top of the first floor level. 	

Categorizing the Garage or Carport

Many dwelling units have garages or carports attached to, or incorporated into the design of the dwelling. Use the following explanations in Table 3-2 to determine a dwelling's garage type.

Table 3-2. Garage/Carport Types

Garage/Carport Types	Figure
<p>Attached garage has the following characteristics:</p> <ul style="list-style-type: none"> ■ completely enclosed structure ■ one or more walls in common with the dwelling ■ measurable dimensions. 	
<p>Integral garage has the following characteristics:</p> <ul style="list-style-type: none"> ■ part of the dwelling with living area on two or more surfaces ■ dimensions that are not easily measurable from the exterior. <p>Note: Many homes have garages with dimensions that are not easily measurable from the exterior because the area immediately behind the garage is a finished living space. In other types of homes, the living space may be on the floor above the garage. In either case, the garage is included in the base area calculation. After the dwelling is priced, the area of the integral garage is estimated using its car capacity and is deducted from the base area of the dwelling.</p>	
<p>Basement garage has the following characteristics:</p> <ul style="list-style-type: none"> ■ located on the basement level ■ entrance on the basement level. 	
<p>Shed-type carport has the following characteristics:</p> <ul style="list-style-type: none"> ■ flat roof, independent of the dwelling's roof ■ open sides and ends 	

Garage/Carport Types	Figure
<p>Integral roof extension type carport has the following characteristics:</p> <ul style="list-style-type: none"> ■ roof that is a continuation of the basic roof structure of the dwelling ■ open sides and ends. 	

Labeling the Sketch Grid

When you record the physical characteristics of the dwelling on the sketch grid of the property record card, use abbreviations and symbols to identify such elements as:

- base area components
- construction materials
- story heights
- exterior features.

Table 3-3 lists the abbreviations, and the examples that follow demonstrate how to record the abbreviations on the sketch grid.

Table 3-3. Abbreviations for Use on the Sketch Grid

Base Area Components	
For this component	Use this abbreviation
Attic	A
Basement	B
Bay; a wall projection that extends beyond the normal line of the dwelling	Bay
Crawl space	C

Overhang; an upper floor area that extends beyond the area below it	Oh
---	----

Construction Materials

For this material	Use this abbreviation
Artificial brick	Art br
Artificial stone	Art stn
Brick	Br
Concrete block	CB
Concrete	Conc
Enamel steel	Enal st
Frame	Fr
Glass	Gl
Stucco	Stco
Stone	Stn
Tile	Tile
Metal	Mtl

Story Heights

For this story height	Use this abbreviation
One-story	1s
One and one-half stories	1-1/2s
Two stories	2s
Bi-level	Bi
Tri-level	Tri

Garage or Carport

For this item	Use this abbreviation
Basement garage	Bsmt G
Carport	CP
Garage	G
Integral garage	IG

Garage Car Capacity

For this capacity	Use this abbreviation
One car capacity	1c
One and one-half car capacity	1+c

Two car capacity	2c
Two and one-half car capacity	2+c
Three car capacity	3c
Exterior Features	
For this feature	Use this abbreviation
Balcony	Balc
Brick patio	BrP
Canopy – shed type	Cnpy
Canopy – roof extension	RFX
Concrete patio	Conc P
Concrete terrace	Conc T
Enclosed frame porch	EFP
Enclosed masonry porch	EMP
Flagstone patio	FsP
Masonry stoop	MStp
Open frame porch	OFP
Open masonry porch	OMP
Portico	Port
Wood deck	WdDk
Wood patio	WdP
Miscellaneous Features	
For this feature	Use this abbreviation
Car shed	CS
Party wall	PW
Unfinished interior	UF

Example 1: When entering abbreviations, include the information in the following order: story height; construction material; and special feature, such as an overhang or bay. To indicate a one-story frame bay on a dwelling, enter: 1sFrBay.

Example 2: *If the dwelling has a garage or carport, include the abbreviations for the car capacity and construction type. To indicate a two car brick garage, enter: 2cBrG.*

Example 3: *If the dwelling has an attic*, enter the abbreviation for the attic over the abbreviation for the base component, and separate them by a horizontal line. To indicate a two-story brick dwelling with an attic, enter:

$$\frac{A}{2sBr}$$

Example 4: *If the dwelling has basement or crawl space*, enter the abbreviation for the basement or crawl space under the abbreviation for the base component, and separate them by a horizontal line. To indicate a one-story frame dwelling with a 1/2 crawl space, enter:

$$\frac{1sFr}{\frac{1}{2}C}$$

Example 5: *If the dwelling has mixed construction features*, the abbreviation for the construction material of the upper story is entered over the abbreviation for the lower story. To indicate a two-story dwelling with upper story frame construction and lower story brick construction, enter:

$$\frac{1sFr}{1sBr}$$

Completing a Property Record Card

The sections below describe in detail how to complete each relevant section of the state's version of the Residential Property Record Card for a dwelling unit. Figure 3-3 shows the side of the property record card that you complete for a dwelling. As you read these instructions, keep in mind that your county's property record card may be slightly different.

Note: If the parcel has two or more free-standing dwellings, or row-type dwellings that are different from each other, record the data for each dwelling on a separate property record card.

Providing Descriptive Data

Before you can determine the replacement cost of a dwelling, you need to describe its features and construction. The steps for recording descriptive data about a dwelling are grouped into the following tasks, described in the sections below:

- Task 1—Complete the sketch grid.
- Task 2—Record the dwelling's general characteristics.
- Task 3—Record information about the dwelling's construction and floor areas.

IMPROVEMENT DATA AND COMPUTATIONS																			
Occupancy		Story Height		Attic		Bsmt Crawl		Major Items											
1 <input type="checkbox"/> Single Family 2 <input type="checkbox"/> Duplex 3 <input type="checkbox"/> Triplex 4 <input type="checkbox"/> 4-5 Family 5 <input type="checkbox"/> M. Home 0 <input type="checkbox"/> Row-type		--- --- 2 Bi-level 3 Tri-level 4 Full		0 None 1 Unfinished 2 1/2 Finished 3 3/4 Finished 4 Finished		0 None 1 1/4 2 1/2 3 3/4 4 Full		C Concrete Floor D Dirt Floor E Electric Lights G Gravel H Heating I Insulation P Plumbing Q Living Quarters S Stalls T Type of Construction											
Construction 1 Frame or Aluminum 2 Stucco 3 Tile 4 Concrete Block 5 Metal 6 Concrete 7 Brick 8 Stone w/Masonry 9 Frame w/Masonry		Base Area Floor Attic Basement Crawl		Finished Living Area Value		Residential BOAT HOUSE T/G/D/A O/S CAR SHED T/G/D Open/Enclosed Open/Back Shail Walls DETACHED GARAGE T/G/D/L/Q GREENHOUSE G Free Standing Attached at End STABLES T/D/G/L SWIMMING POOL Underwater Lighting Tile: Ceramic/Plastic Filter Heater Triangular Shape Concrete Apron Enclosure Type TENNIS COURT Utility Shed UTILITY SHED T/G		Agricultural BARNS T/S/L/P/E/I/D/Q Open Side CONFINEMENT P/I Stalled Floors Pils CORN CRIB Frame/Wire Free-standing Drive-In No Roof GRANARIES L Storage Bins T/G/D/A Poles GRANARIES - STEEL Diameter & Height or Bushel Capacity QUONSET BUILDINGS Floor: Asphalt/Concrete SLURRY TANKS Inground/above ground Inground Plank Covering Cover SILO Concrete: Conc. Slab/Reinfrd Tile/Conc. Blk./Brick Steel: Unreinf/Glass Lined NUT TRENCH & BUNKER SILOS Depth Width											
O T E N																			
SUMMARY OF RESIDENTIAL IMPROVEMENTS																			
ID	Use	Story Height	Const. Type	Grade	Year Const.	Eff. Age	Cond.	Base Rate	Features	L/M	Adj. Rate	Size or Area	Replacement Cost	Total Degr.	Remainder Value	% Comp	Nhhd Factor	Improvement Value	
01	Dwelling																		
Supplemental Card Residential Improvement Total																			
Total Residential Improvement Value																			
SUMMARY OF NON-RESIDENTIAL IMPROVEMENTS																			
ID	Use	Story Height	Const. Type	Grade	Year Const.	Eff. Age	Cond.	Base Rate	Features	L/M	Adj. Rate	Size or Area	Replacement Cost	Normal Degr.	Remainder Value	% Abnom. Obs.	Nhhd Factor	Improvement Value	
01																			
Supplemental Card Non-Residential Improvement Total																			
Total Non-Residential Improvement Value																			

Figure 3-3. Sketch Grid

Task 1—Completing the Sketch Grid

You record the physical characteristics of the dwelling and yard improvements on the parcel on the back of the property record card. A sketch grid, shown in Figure 3-4, is provided on the property record card to make a plain view sketch of the dwelling on the property. On the sketch grid, you also indicate the source of the data collected for the property.

To complete the sketch grid on the property record card, perform these steps:

- Step 1 Draw the dwelling to scale as closely as possible. Orient the dwelling with the side facing the street toward the bottom of the sketch grid.
- Step 2 On your sketch, enter all outside dimensions of the dwelling required to compute the gross square foot ground area. Guidelines are provided in the section *Measuring and Calculating Areas* in this chapter.
- Step 3 Compute the gross square foot ground area of the dwelling.
- Step 4 Enter the story height of the dwelling. Information about determining story height is provided in the section *Determining the Story Description* in this chapter.
- Step 5 Identify all additions to the dwelling, such as porches, canopies, decks, and other exterior features, and their
 - outside dimensions
 - computed gross square foot ground area
 - story height.
- Step 6 Use abbreviations and symbols to label components of the dwelling in the sketch area. Guidelines are provided in the section *Labeling the Sketch Grid* in this chapter.

- Step 7 To indicate the source of the property data, circle the appropriate letter or letters listed in the bottom left of the sketch grid. Table 3-4 describes the options.

Table 3-4. Source of Property Data Options

This option	Indicates
O	Owner
T	Tenant
E	Estimated
N	Dwelling was not entered, information was obtained at the door.

Task 2—Recording General Characteristics

The property record card provides space, shown in Figure 3-5, to record a general description of the dwelling.

IMPROVEMENT DATA AND COMPUTATIONS											
Occupancy		Story Height		Attic		Basmt Crawl		Major Items		Improvement Features	
Construction		Base Area		Floor		Finished Living Area		Residential		Agricultural	
1 Single Family		0 None		0 None		0 None		BOAT HOUSE		BARN	
2 Duplex		1 Unfinished		1 1/4		1 1/4		T/G/D/Q		T/S/L/P/E/I/D/Q	
3 Triplex		2 1/2 Finished		2 1/2		2 1/2		CONCRETE		GREEN SIDE	
4 4.5 Family		3 B-level		3 3/4 Finished		3 3/4		C/RN CRIB		T/P/E/C/I	
5 M. Home		3 Tri-level		4 Finished		4 Full		P Heating		Slatted Floors	
		4 Full		4 Full		4 Full		L Loft		Pls	
								Q Living Quarters		Frame/Wire	
								S Slats		Free-standing Drive-thru	
								T Type of Construction		No Roof	
										GRAMMIES	
										L Storage Bins	
										GRAIN BINS - STEEL	
										Diameter & Height or	
										Lift Capacity	
										LIFT BUILDINGS	
										E/I/H	
										SLURRY TANKS	
										Floor: Asphalt/Concrete	
										Round/Rectangle	
										Plank Cover/No Cover	
										SILO	
										C/C	
										Conc Slab/Reinfrd	
										Masonry	
										Tile/Conc. Blk/Brick	
										Steel	
										Underwater Lighting	
										Tile: Ceramic/Plastic	
										Filter	
										Non-rectangular Shape	
										Concrete Apron	
										Enclosure Type	
										Type of Material	
										Cib/Sod/Asphalt	
										UTILITY SHED	
										T/G	

SUMMARY OF RESIDENTIAL IMPROVEMENTS																		
ID	Use	Story Height	Const. Type	Grade	Year Const.	Eff. Age	Cond.	Base Rate	Features	L/M	Adj. Rate	Size or Area	Replacement Cost	Total Degr.	Remainder Value	% Comp	NHhd Factor	Improvement Value
01	Dwelling																	
02																		
03																		
04																		
05																		
06																		
07																		
													Supplemental Card Residential Improvement Total					
													Total Residential Improvement Value					

SUMMARY OF NON-RESIDENTIAL IMPROVEMENTS																		
ID	Use	Story Height	Const. Type	Grade	Year Const.	Eff. Age	Cond.	Base Rate	Features	L/M	Adj. Rate	Size or Area	Replacement Cost	Normal Degr.	Remainder Value	Abnorm. Obs.	NHhd Factor	Improvement Value
01																		
02																		
03																		
04																		
05																		
06																		
													Supplemental Card Non-Residential Improvement Total					
													Total Non-Residential Improvement Value					

Figure 3-5. Providing a General Description of the Dwelling

To record a general description of the dwelling, perform the following steps:

Step 1 In the “Occupancy” section, place a check in the check box corresponding to the occupancy for which the dwelling was designed. If the dwelling is free standing, check only one of the options. If the dwelling consists of row type or attached units, check more than one option. Table 3-5 describes the occupancy options.

Note: When determining the occupancy for which the dwelling was designed, always treat basement and attic living units as conversion units, regardless of whether they were incorporated into the original design.

Table 3-5. Occupancy Options

This option	Indicates
1	A dwelling designed for occupancy by one family with one living unit. <i>If the dwelling has been converted for occupancy by two or more families, enter the number of current living units in the check box instead of a check.</i>
2	A two-story dwelling designed for occupancy by two families, with one living unit on each floor. <i>If the dwelling has been converted for occupancy by three or more families, enter the number of living units in the check box instead of a check.</i>
3	A three-story family dwelling designed for occupancy by three families, with one living unit on each floor. <i>If the dwelling has been converted for occupancy by four or more families, enter the number of living units in the check box instead of a check.</i>
4	A detached, free-standing two or three-story dwelling, with two living units on each floor that are accessed by a center hall. <i>If the dwelling has been converted for occupancy by five or more families in the case of a four-family design, or seven or more families in the case of a six-family design, enter the number of living units in the check box instead of a check.</i>
5	A dwelling unit designed as a manufactured home or a mobile home. Instructions for valuing a manufactured home or a mobile home as real property are provided in Chapter 4.

This option	Indicates
6	<p>Dwelling units separated by vertical common walls, such as two-family doubles or townhouses. Row-types are generally a series of single-family dwelling units. Follow these guidelines:</p> <ul style="list-style-type: none"> ■ Place a check in the “Row-Type” check box. ■ On the line provided to the left of “Row-Type,” enter the total number of row-type units in the entire building, even if the other dwelling units are different in appearance from the unit that you sketched. ■ <i>If there are two to three units, the units have single ownership, the same square footage, and the same physical characteristics</i>, list and record the data, except exterior features, for one unit. The replacement cost of the building is computed by multiplying the cost of one unit by the number of units within the building. ■ <i>If there are two to three units, the units have single ownership, different square footage or physical characteristics</i>, sketch, list, and record the data for each style unit on individual property record cards. The replacement cost of the building is computed by totaling the cost of all the units contained within the building. ■ <i>If the units have individual ownership</i>, sketch, list, and record the data for each individual unit on a separate property record card. The replacement cost of each unit is calculated and assessed separately. This procedure applies to all individually-owned platted row-type units regardless of the number of units contained within the structure. Such units are found in horizontal property regime or planned unit development properties. ■ <i>If there are four or more units and the units have single ownership</i>, the structure is considered commercial and priced from the commercial pricing guidelines as an apartment building.

Step 2 In the “Story Height” section, identify the story height of the dwelling. Table 3-6 describes the story height options. Circle one-story height option for the dwelling.

If neither the bi-level nor tri-level description applies to the dwelling, enter the most representative story height in the space provided at the top of the Story Height. The space appears as

___ . ___ [] ___

Enter the information as follows:

- In the first two character positions, enter the story height, excluding the basement. Record the story height in half-story increments. For example, enter 1.0 for one-story, 1.5 for one and one-half stories, 2.0 for two stories, and so forth. There is no limit to the number of stories.
- In the bracket and the character positions to the right, enter the wall height adjustment to account for intermediate wall heights, if necessary. Enter “+” or “-” in the bracket, and “1” in the character position to indicate plus or minus one-half, the difference between the given story height and the next one-half story increment.

Table 3-6. Story Height Options

This option	Indicates
2	A two-level (bi-level) design in which the first floor is partially below grade and the entry or foyer is on a level between the first and second floors. This design also is referred to as a “raised ranch.”
3	A split-level (tri-level) design of three or more levels, not including the basement.

- Step 3 In the “Attic” section, circle the code that best describes the attic. Table 3-7 describes the attic options.

Table 3-7. Attic Options

This option	Indicates
0	No attic
1	An unfinished attic with only a subfloor and stairs
2	A divided attic with approximately one-half of the area finished and one-half unfinished
3	Either a divided attic with approximately three-fourths of the area finished and one-fourth unfinished, or an undivided attic that is fully finished
4	A divided and fully finished attic

- Step 4 In the “Bsmt” section, circle the code that best describes the basement. Table 3-8 describes the basement options.

Table 3-8. Basement Options

This option	Indicates
0	No basement

This option	Indicates
1	Basement is approximately 1/4 of the first floor base area
2	Basement is approximately 1/2 of the first floor base area
3	Basement is approximately 3/4 of the first floor base area
4	Basement is approximately all of the first floor base area

Step 5 In the “Crawl” section, circle the code that best describes the crawl space. Table 3-9 describes the crawl space options.

Table 3-9. Crawl Space Options

This option	Indicates
0	No crawl space
1	Crawl space is approximately 1/4 of the first floor base area
2	Crawl space is approximately 1/2 of the first floor base area
3	Crawl space is approximately 3/4 of the first floor base area
4	Crawl space is approximately all of the first floor base area

Task 3—Recording Information About the Construction and Floor Areas

The property record card provides space, shown in Figure 3-6, to record information about the construction of the dwelling unit, as well as the floor area information necessary to determine the total base price for the dwelling unit.

IMPROVEMENT DATA AND COMPUTATIONS																			
Major Items					Improvement Features														
Major Items					Improvement Features														
Occupancy 1 <input type="checkbox"/> Single Family 2 <input type="checkbox"/> Duplex 3 <input type="checkbox"/> Triplex 4 <input type="checkbox"/> 4-5 Family 5 <input type="checkbox"/> M. Home 0 <input type="checkbox"/> Row-type					Story Height --- --- [] --- --- 2 Bi-level 3 Tri-level					Attic 0 None 1 Unfinished 2 1/2 Finished 3 3/4 Finished 4 Finished					Basement/Crawl 0 None 1 1/4 2 1/2 3 3/4 4 Full				
Construction 1 Frame or Aluminum 2 Stucco 3 Tile 4 Concrete Block 5 Metal 6 Concrete 7 Brick 8 Stone 9. Frame w/Masonry					Base Area Floor * * * Attic Basement Crawl ---					Finished Living Area Value					TOTAL BASE Row-type Adjustment SUB-TOTAL				
Roofing <input type="checkbox"/> Asphalt Shingles <input type="checkbox"/> Slate or Tile <input type="checkbox"/> Metal <input type="checkbox"/> Floors B 1 2 <input type="checkbox"/> Earth <input type="checkbox"/> Slab <input type="checkbox"/> Sub & Joists <input type="checkbox"/> Wood <input type="checkbox"/> Parquet <input type="checkbox"/> Tile <input type="checkbox"/> Carpet <input type="checkbox"/> Unfinished <input type="checkbox"/> Interior Finish <input type="checkbox"/> Plaster or Dry Wall <input type="checkbox"/> Paneling <input type="checkbox"/> Fiberboard <input type="checkbox"/> Unfinished <input type="checkbox"/> No Electrical Service <input type="checkbox"/> Accommodations					TOTAL BASE Row-type Adjustment SUB-TOTAL Unfinished Interior [-] Extra Living Units [+] Rec. Room [+] Loft [+] Fireplace [+] No Heating [-] Air Conditioning [+] No Electrical Service [-] Plumbing TF: --- -5 = --- x 700 No Plumbing [-] Specialty Plumbing [+] SUB-TOTAL, ONE UNIT SUB-TOTAL, --- UNITS Garages Integral [-] Attached Garage [+] Attached Carport [+] Basement [+] Exterior Features Grade and Design Factor ()					Use Dwelling					ID 01 02 03 04 05 06 07				
SUMMARY OF RESIDENTIAL IMPROVEMENTS O T E N										SUMMARY OF NON-RESIDENTIAL IMPROVEMENTS									
Major Items C Concrete Floor D Dr. Floor E Electric Lights G Grade H Heating I Insulation L Loft P Plumbing S Siding T Type of Construction T Frame/Wire T Remanding Drive-thru T No Roof T Floor GRANARIES Storage Bins Pole Type GRAIN BINS - STEEL In-ground Light or Bunk Capacity QUONSET BUILDINGS E / I / H S / U / R / T / A N K S In-ground/concrete In-ground/above ground Round/Rectangle Round/Rectangle In-ground Cover SILO Conc. Slab/Reinfd Masonry Masonry, Blk./Brick Steel Unreid/Glass Lined Metal TRENCH & BUNKER SILOS Depth Width										Major Items C Concrete Floor D Dr. Floor E Electric Lights G Grade H Heating I Insulation L Loft P Plumbing S Siding T Type of Construction T Frame/Wire T Remanding Drive-thru T No Roof T Floor GRANARIES Storage Bins Pole Type GRAIN BINS - STEEL In-ground Light or Bunk Capacity QUONSET BUILDINGS E / I / H S / U / R / T / A N K S In-ground/concrete In-ground/above ground Round/Rectangle Round/Rectangle In-ground Cover SILO Conc. Slab/Reinfd Masonry Masonry, Blk./Brick Steel Unreid/Glass Lined Metal TRENCH & BUNKER SILOS Depth Width									
Features L / M Base Rate Cont. Eff. Age Year Const. Grade Const. Story Height Const. Type Use										Features L / M Base Rate Cont. Eff. Age Year Const. Grade Const. Story Height Const. Type Use									
Replacement Cost Total Residential Improvement Value										Replacement Cost Total Residential Improvement Value									
Normal Depr. Abnorm. Obs. Nhibd Factor Improvement Value										Normal Depr. Abnorm. Obs. Nhibd Factor Improvement Value									
Appraiser / Date										Appraiser / Date									
Data Collector / Date										Data Collector / Date									

Figure 3-6. Describing the Construction and Providing Floor Area Information

To complete this section of the property record card, perform these steps:

Step 1 In the “Construction” section, record the base area for each floor, the exterior wall construction, the story height, and the amount of finished living area:

- a. Enter the area of each floor on a separate row in the “Base Area” column.

If the dwelling has an attic, basement, or crawl space, enter each area in the appropriate row.

- b. Determine the dwelling’s exterior wall type for each story and enter the corresponding code in the column to the left of the “Base Area” column. Follow these guidelines.
 - *If a story has a mixture of similar exterior wall type materials such as frame (codes 1 through 5) or masonry (codes 6 through 8), record the exterior wall type code that represents the majority material of the story.*
 - Code 9 applies only to mixed frame and masonry exterior wall construction, and requires a two-digit code. This code represents a 1/6 increment interpolation procedure between the cost difference for frame and masonry construction. Table 3-10 describes the two-digit codes.

Table 3-10. Mixed Frame and Masonry Wall Construction Codes

This code	Indicates
91	Frame construction with masonry on approximately half of the surface area of one side, or the full surface area of one end
92	Frame construction with masonry on approximately the full surface area of one side, or the full surface area of both ends
93	Half frame construction and half masonry construction
94	Predominantly masonry construction in which the full surface of both sides, or one side and both ends are masonry
95	Predominantly masonry construction in which the full surface of both sides, and one end are masonry

- c. In the “Floor” column, record each story height in half story increments. For intermediate story heights, record a “+1” or a “-1” to record the difference of a half story.

- d. In the “Finished Living Area” column, record the total finished area for each floor, as well as for the attic and basement.

The square foot area of an unfinished utility area or an integral garage is not included in the “Finished Living Area” square footage.

Note: This column is optional unless there is finished area in the basement or attic. Then you must enter the finished area in those rows.

- Step 2 In the “Roofing” section, place a check in the check box corresponding to the dwelling’s predominant roofing material. If more than one material is used, indicate the other materials by entering “p” for part in the check box instead of a check. A blank line is provided to record any roofing material other than those listed.
- Step 3 In the “Floors” section, check the floor construction and the finish flooring for each floor. Follow these guidelines:
- The column heading “B” indicates basement, “1” indicates first floor, “2” indicates second floor, and the undesignated column can be used to indicate a third floor or attic.
 - *If there is more than one upper floor and the construction or finish is not consistent*, enter the floor level “2”, “3”, “4”, or “A” for attic in the check box instead of a check.
 - *If there is more than one type of floor construction or finish on one floor*, enter “p” for part in the check box instead of a check.
- Step 4 In the “Interior Finish” section, check the finish for each floor, as well as the basement and the attic, if applicable. Follow these guidelines:
- The column heading “B” indicates basement, “1” indicates first floor, “2” indicates second floor, and the undesignated column can be used to indicate a third floor or attic.
 - *If the finish of any of the floors is not consistent*, enter the number of rooms to which the finish applies in the check box instead of a check.
 - *If no electrical service is supplied to any individual floor levels*, place a check in the appropriate floor level check box in the “No Electrical Service” row.
- Step 5 In the “Accommodations” section, enter the number of specific rooms and fireplaces in the dwelling:
- a. In the “Total Number of Rooms” cell, enter the total number of finished rooms, bathrooms, and utility rooms. When counting rooms, a kitchen-dining or living-dining combination is considered one room.
 - b. In the “Bedrooms” cell, enter the total number of rooms specifically designed as bedrooms, regardless of use.

- c. In the “Family Room” cell, enter the total number of family rooms and informal living rooms with a quality of finish consistent with the general finish of the dwelling. There is a separate entry for basement recreation rooms.
- d. In the “Formal Dining Room” cell, enter the total number of rooms specifically designed for dining, regardless of use.
- e. *If there are any rooms used for commercial purposes*, such as a commercial office, beauty salon, or any other room not typical of residential dwellings, list the room(s) in the blank space provided below “Formal Dining Room”. To the right of this cell, enter the total number of these rooms. In the “Memorandum” section, enter a brief description of the commercial activity and the approximate commercial square footage.
- f. In the “Loft Area” cell, enter the approximate square footage of the loft’s floor area. A loft is a finished platform-type area overlooking the first floor. A loft usually appears in a structure with cathedral type ceilings and is not to be confused with areas of a dwelling that have partial or full exterior walls that make the dwelling a one and one-half story to a two-story dwelling.
- g. *If there are any basement recreation rooms that add value to the dwelling*, use Table 3-11 to determine the appropriate code for the basement recreation room, and enter the code in the “Type” cell. Record the approximate area in the “Area” cell.

Table 3-11. Basement Recreation Room Codes

This code	Indicates the presence of
Rec 1	Flooring and ceiling finish
Rec 2	Flooring, ceiling, and interior wall finish
Rec 3	Flooring, ceiling, interior wall finish, and partitioning
Rec 4	Flooring, ceiling, interior wall finish, partitioning, and built-ins

- h. *If there are any fireplaces*, indicate the construction type, number of stacks, and number of openings. Follow these guidelines:
 - *If the fireplace is a prefabricated metal type, ventless gas, or vent-free gas place a check in the “Metal” check box.* In the “Stacks” cell, enter the total number of stacks. In the “Openings” cell, enter the total number of fire openings.
 - *If the fireplace is the traditional masonry type*, place a check in the “Masonry” check box. In the “Stacks” cell, enter the total number

of stacks. In the “Openings” cell, enter the total number of openings.

- Step 6 In the “Heating & Air Conditioning” section, indicate the type of heating system that the dwelling has. Follow these guidelines:
- Place a check in the cell corresponding to the type of heating that the dwelling has.
 - *If the dwelling has a heating system other than those listed, write a description in the blank space provided and place a check in the corresponding cell.*
 - *If a dwelling has a geothermal or solar heating system as its sole central heating system, place a check in the “No Heat” cell and write “geothermal heating only” or “solar heating only” in the blank space provided.*
 - *If the dwelling has no central heating system, place a check in the “No Heat” cell, and circle “Gravity”, “Wall”, or “Space”.*
 - *If there is central heating for a portion of a finished living area, enter those floors or that area instead of a check. A partial adjustment to the base price is made when a portion of the dwelling does not have a central heating system.*
- Step 7 Also in the “Heating & Air Conditioning” section, place a check in the “Central Air Cond.” cell to indicate that the dwelling has either a separate or combined central air conditioning system. Follow these guidelines:
- *If there is central air conditioning for only a portion of a finished living area, enter those floors or that area instead of a check.*
 - *If the dwelling has a heat pump listed as the heating system, place a check in the “Central Air Cond.” cell.*
 - *If the dwelling has a geothermal or solar cooling system as its sole central cooling system, do **not** enter a check in the “Central Air Cond.” cell. Geothermal and solar systems are priced in the “Summary of Improvements” section of the Property Record Card from schedules included in Appendix C.*
- Step 8 In the “Extra Living Unit” cell, enter the number of either conversion living units or designed living units over and above the base unit included in the residential model. For example, a three-story dwelling designed for occupancy by three families would have one unit included in the residential model and the number 2 recorded in the designed extra living unit cell.
- Note:** All basement and attic living units are to be considered as conversion units.
- Step 9 In the “Plumbing” section, enter the number of full and half baths, kitchen sinks, water heaters, and extra fixtures in the “#” column. In the

“TF” column, enter the total number of plumbing fixtures in each category. Follow these guidelines:

- *If the dwelling does not have plumbing*, place a check in the “No Plumbing” check box.
- A full bath has three plumbing fixtures and a one-half bath has two fixtures.
- A total of more or fewer than five fixtures requires an adjustment in the dwelling’s base price. The following five plumbing fixtures are included in the base price:
 - kitchen sink
 - water heater
 - bathroom sink
 - bathroom stool
 - bathtub or shower unit.
- The presence of a designed or conversion living unit accounts for five plumbing fixtures within the dwelling. These five fixtures are not recorded in the “Plumbing” section. Any extra living unit plumbing fixtures above or below the included five should be recorded in the “Plumbing” section.

Completing the Replacement Cost Pricing Ladder

This section describes how to determine the replacement cost of the dwelling using the section of the Residential Property Record Card commonly referred to as the replacement cost pricing ladder. The steps for completing this section of the property record card are grouped into the following tasks, described in the sections below:

- Task 1—Determine the dwelling’s base price.
- Task 2—Determine and apply any necessary row-type adjustments to the dwelling’s base price.
- Task 3—Determine and apply any interior feature adjustments to the dwelling’s base price.
- Task 4—Determine and apply any exterior feature adjustments to the dwelling’s base price.
- Task 5—Record and apply the dwelling’s grade to calculate the adjusted subtotal.
- Task 6—Determine and apply the location cost multiplier adjustment to calculate the dwelling’s replacement cost.

Task 1—Determining the Base Price

Cells are provided on the Residential Property Record Card to determine the base price of the dwelling, as shown in Figure 3-7.

IMPROVEMENT DATA AND COMPUTATIONS									
Major Items					Improvement Features				
Residential					Agricultural				
C Concrete Floor D Drift Floor E Electric Lights G Grade H Heating L Loft P Plumbing S Sewing Quarters T Type of Construction T Frame/Wire T Non-Standard Drive-thru T No. of Driveway T Floor GRANARIES Storage Bins Pole Type GRAIN BINS - STEEL Blended & Height or Blended QUONSET BUILDINGS E/I/H SUGAR PLANKS Inground/above ground Round/Rectangle Round/Rectangle In-ground/No Cover SLO Conc. Slab/Reinfd Masonry Masonry Conc. Blk./Brick Steel Unlined/Glass Lined V Ceramic/Plastic Heater Non-rectangular Shape Enclosure Type TENNIS COURT Clay/Grass/Asphalt UT T/G					BARNS T/S/L/P/E/I/D/Q T/S/L/P/E/I/D/Q CONFINEMENT T/P/E/C/I Stalled Floors J CORR CRIB T Frame/Wire Non-Standard Drive-thru T No. of Driveway T Floor GRANARIES Storage Bins Pole Type GRAIN BINS - STEEL Blended & Height or Blended QUONSET BUILDINGS E/I/H SUGAR PLANKS Inground/above ground Round/Rectangle Round/Rectangle In-ground/No Cover SLO Conc. Slab/Reinfd Masonry Masonry Conc. Blk./Brick Steel Unlined/Glass Lined V Ceramic/Plastic Heater Non-rectangular Shape Enclosure Type TENNIS COURT Clay/Grass/Asphalt UT T/G				
SUMMARY OF RESIDENTIAL IMPROVEMENTS ID Use Story Const. Height Year Const. Grade Const. Age Eff Const. Base Rate Features L/I/M Adj. Rate Size or Area Replacement Cost Total Depr. Remainder Value % Nhd Comp Factor Improvement Value 01 Dwelling 02 03 04 05 06 07 SUB-TOTAL ADJUSTED SUB-TOTAL Grade and Design Factor () ADJUSTED SUB-TOTAL Location Multiplier Replacement Cost Heating & Air Conditioning Plumbing Full Bath Half Baths Kitchen Sink Water Heater Extra Fixtures TOTAL No Plumbing									
SUMMARY OF NON-RESIDENTIAL IMPROVEMENTS ID Use Story Const. Height Year Const. Grade Const. Age Eff Const. Base Rate Features L/I/M Adj. Rate Size or Area Replacement Cost Normal Remainder Value Abnorm. Nhd Obs. Factor Improvement Value 01 02 03 04 05 06 07 SUB-TOTAL ADJUSTED SUB-TOTAL Location Multiplier Replacement Cost Heating & Air Conditioning Plumbing Full Bath Half Baths Kitchen Sink Water Heater Extra Fixtures TOTAL No Plumbing									

Figure 3-7. Cells Used to Determine Base Price

Use Schedule A—Dwelling Base Prices, provided in Appendix C, to determine the base price of the dwelling. The schedule consists of two parts:

- prices that are based on the size of the single-family dwelling, type of exterior walls, and the number of story heights
- prices for unfinished attics, finished attics, unfinished basements, finished basements, and crawl spaces.

The procedure for developing the total base price from Schedule A is to select the base price for the main living area of the dwelling and add the appropriate amounts for attics, basements, and crawl spaces.

Schedule A includes prices for areas ranging from 100 to 5,000 square feet. Within this range, the price is listed in two different increments, depending on the area:

- For an area of 100 to 4,000 square feet, the prices are listed in intervals of 25 square feet.
- For an area of 4,000 to 5,000 square feet, the prices are listed in intervals of 250 square feet.

To determine the base price of a dwelling, perform the following steps:

Step 1 Use Schedule A to determine the base price of the dwelling's first floor:

- a. In the "Area" column, locate the row corresponding to the area closest to the first floor's area.
- b. Locate the appropriate column below the heading "First Floor." *If the primary wall type is Type 1, 2, 3, 4, or 5, use the column "1-5". If the primary wall type is Type 6, 7, or 8, use the column "6-8".*
- c. Find the intersection of the selected row (area in square feet) and the selected column. Note the number that you find.
- d. *If the area is between 4,000 and 5,000 square feet, interpolate the base price between the prices for the two closest areas. Each interval of 25 square feet is equal to 10% of the increment price. Note this number instead of the number found in Step c.*
If the area is over 5,000 square feet, use the difference between the base price for 4,750 square feet and for 5000 square feet to calculate the amount to add to the base price for 5000 square feet for the additional square footage. Note this number instead of the number found in Step c.
- e. *If the first floor has an exterior wall code of 91 through 95, locate the "+" column below the heading "First Floor" and perform Step f through Step h.*
- f. Find the intersection of the selected row (area in square feet) and the selected column. Note the number that you find.

- g. Multiply the number found in Step f by the number of increments of masonry identified for the dwelling. If the wall code is 92, multiply the number from Step f by 2.

Add the result to the number found in Step c or Step d. Note this number.

- h. Calculate the base price for the first floor by multiplying the number by \$100, round the number to the nearest \$10, and enter it in the first row of the “Value” column on the property record card.

Step 2 *If the dwelling has one and one-half stories, use Schedule A to determine the base price of the one-half story:*

- a. In the “Area” column, locate the row corresponding to the area closest to the half story’s area.
- b. Locate the appropriate column below the heading “Half Upper Story” using the explanation in Step 1b.
- c. Find the intersection of the selected row (area in square feet) and the selected column. Note the number that you find.
- d. *If the area is larger than 4,000 square feet, interpolate the base price following the guidelines in Step 1d.*
- e. *If the half story has an exterior wall type code of 91 through 95, locate the “+” column below the heading “Half Upper Story”, and determine the adjustment by performing Steps 1f through 1h.*
- f. Calculate the base price for the one-half story by multiplying the number by \$100, and enter it in the appropriate row of the “Value” column on the property record card.

Step 3 *If the dwelling has an intermediate story height, use Schedule A to determine the base price of the intermediate story:*

- a. In the “Area” column, locate the row corresponding to the area closest to the half story’s area.
- b. Locate the appropriate column below the heading “(+/-1)” using the explanation in Step 1b.
- c. Find the intersection of the selected row (area in square feet) and the selected column. Note the number that you find.
- d. *If the area is larger than 4,000 square feet, interpolate the base price following the guidelines in Step 1d.*
- e. Calculate the base price for the intermediate story by multiplying the number by \$100 to arrive at the dollar amount of the base price, and enter it in the appropriate row of the “Value” column on the property record card.

- Step 4 *If the dwelling has two stories, use Schedule A to determine the base price of the second story:*
- In the “Area” column, locate the row corresponding to the area closest to the second story’s area.
 - Locate the appropriate column below the heading “Full Upper Story” using the explanation in Step 1b.
 - Find the intersection of the selected row (area in square feet) and the selected column. Note the number that you find.
 - If the area is larger than 4,000 square feet, interpolate the base price following the guidelines in Step 1d.*
 - If the second story has an exterior wall code of 91 through 95, locate the “+” column below the heading “Full Upper Story”, and determine the adjustment by performing Steps 1f through 1h.*
 - Calculate the base price for the second story by multiplying the number by \$100, and enter it in the appropriate row of the “Value” column on the property record card.

- Step 5 *If the dwelling has an unfinished attic, use Schedule A to determine the base price of the attic:*

Note: The square foot area used in the calculation for an attic is the base ground floor area and not the actual attic floor. The attic cost schedules included in Schedule A consider the loss of floor area and wall height in typical attic construction.

- In the “Area” column, locate the row corresponding to the area closest to the attic area.
 - Locate the “Unfin Attic” column.
 - Find the intersection of the selected row (area in square feet) and the “Unfin Attic” column. Note the number that you find.
 - Calculate the base price for the unfinished attic by multiplying the number found in Step c by \$100, and enter it in the appropriate row of the “Value” column on the property record card.
- Step 6 *If the dwelling has an attic with finished area, use Schedule A to determine the base price of the attic:*
- Determine the base price of the unfinished attic area by performing Step 5.
 - In the “Area” column, locate the row corresponding to the area closest to the finished attic area.
 - Locate the “Attic Fin” column.

- d. Find the intersection of the selected row (area in square feet) and the “Attic Fin” column. Note the number that you find.
- e. Calculate the base price for the finished area of the attic by multiplying the number found in Step d by \$100. Note the result.
- f. Calculate the base price for the attic by summing the base price for the unfinished area (calculated in Step a) and the base price for the finished area (calculated in Step e), and enter it in the appropriate row of the “Value” column on the property record card.

Step 7 *If the dwelling has an unfinished basement*, use Schedule A to determine the base price of the basement:

- a. In the “Area” column, locate the row corresponding to the area closest to the basement area.
- b. Locate the “Unfin Bsmt” column.
- c. Find the intersection of the selected row (area in square feet) and the “Unfin Bsmt” column. Note the number that you find.
- d. Calculate the base price for the basement by multiplying the number found in Step c by \$100, and enter it in the appropriate row of the “Value” column on the property record card.

Step 8 *If the dwelling has a basement with a finished area*, use Schedule A to determine the base price of the basement:

Note: A basement containing finish consistent with the remainder of the dwelling is considered as a finished basement. This is normally defined as basement living quarters. An area having finish inconsistent with the remainder of the dwelling is considered as a basement recreation room.

- a. Determine the base price of the unfinished basement area by performing Step 7a through 7c.
- b. In the “Area” column, locate the row corresponding to the area closest to the finished basement area.
- c. Locate the “Bsmt Fin” column.
- d. Find the intersection of the selected row (area in square feet) and the “Bsmt Fin” column. Note the number that you find.
- e. Calculate the base price for the finished area multiplying the number found in Step d by \$100. Note the result.
- f. Calculate the base price for the basement by summing the base price for the unfinished area (calculated in Step a) and the base price for the finished area (calculated in Step e), and enter it in the appropriate row of the “Value” column on the property record card.

- Step 9 *If the dwelling has a crawl space*, use Schedule A to determine the base price of the crawl space:
- In the “Area” column, locate the row corresponding to the area closest to the crawl space area.
 - Locate the “Crawl” column.
 - Find the intersection of the selected row (area in square feet) and the “Crawl” column. Note the number that you find.
 - Calculate the base price for the crawl space by multiplying the number found in Step c by \$100, and enter it in the appropriate row of the “Value” column on the property record card.
- Step 10 Calculate the total base price by summing the numbers from the first six rows of the “Value” column, and enter the sum in the “Total Base” cell.
- Step 11 *If the dwelling is **not** a row-type dwelling*, transfer the value in the “Total Base” cell to the “Sub-Total” cell.

Example 1: To determine the base price for a dwelling with 4,628 square feet of area, round to the nearest 25 square feet, or 4,625 square feet. To determine the number of 25 square foot intervals between 4,500 and 4,625, subtract 4,500 from 4,625 to obtain 125 square feet. Divide 125 by 25 to obtain five 10% intervals or 50%. Multiply 50% by the difference between the two prices (provided in Schedule A). Add this incremental price to the price provided for 4,500 square feet.

Example 2: To determine the base price for a dwelling with 5,650 square feet of area, use the increment difference between 4,750 square feet and 5,000 square feet for the next 250 square feet and each 250 square feet thereafter. When interpolation becomes necessary within the 250 square feet interval, repeat the procedures described in “example 1” above. Add the incremental price to the price provided for 5,000 square feet.

Example 3: To determine the base price for a two-story dwelling with a base floor area of 800 square feet at each floor level, locate the row for 800 in the “Area” column. Then note the numbers in this row for the “First Floor” and “Full Upper Story” columns. Multiply the two numbers by \$100 and record the result in the corresponding pricing ladder cells.

Example 4: To determine the base price for a two-story dwelling with a base floor area of 800 square feet and an upper floor area of 920 square feet, locate the row for 800 in the “Area” column. Note the number for this row in the “First Floor” column. Locate the row that falls closest to 920, which is 925. Note the number for this row in the “Full Upper Story” column. Multiply the two numbers by \$100 and record the results in the corresponding pricing ladder cells.

Example 5: To determine the base price for a one-story dwelling, 50 feet by 22 feet, with aluminum siding exterior wall construction and a one-half brick front, first find the base price for a one-story dwelling with aluminum siding and then add the adjustment for brick. Locate the row for 1,100 in the “Area” column, and locate the column for “1-5” under the “First Floor” heading. Find the intersection of the selected row and column, and note the number that you find. To determine the adjustment for brick, locate the row for 1,100 in the “Area” column, and locate the column for “+” under the “First Floor” heading. Find the intersection of the selected row and column, and note the number that you find. Add the two numbers together and multiply by \$100 to arrive at the base price for the dwelling.

Example 6: To determine the value of the basement in a 1,200 square foot dwelling with a one-half basement that has 400 square feet of finished area, locate the row for 600 in the “Area” column. Locate the “Unfin Bsmt” column, find the intersection of the selected row and column, and note the number that you find. Locate the row for 400 in the “Area” column and the “Bsmt Fin” column. Find the intersection of the selected row and column, and note the number that you find. Add the two numbers together and multiply by \$100 to arrive at the value of the basement.

Task 2—Determining and Applying the Row-Type Adjustments

If the dwelling is a residential row-type dwelling, use Schedule B—Row-Type Adjustments, provided in Appendix C, to determine the appropriate adjustment to the base price, calculated in Task 1. This schedule lists percentage adjustments based on the wall type and number of units within the dwelling.

Cells are provided on the Residential Property Record Card to determine the row-type adjustment of the dwelling, as shown in Figure 3-8.

IMPROVEMENT DATA AND COMPUTATIONS																			
Occupancy		Story Height	Attic	Bsmt Crawl	Major Items					Improvement Features									
1 <input type="checkbox"/> Single Family 2 <input type="checkbox"/> Duplex 3 <input type="checkbox"/> Triplex 4 <input type="checkbox"/> 4-6 Family 5 <input type="checkbox"/> M. Home 0 <input type="checkbox"/> Row-type		0 None 1 1/4 2 1/2 3 3/4 4 Full	0 None 1 Unfinished 2 1/2 Finished 3 3/4 Finished 4 Full	0 None 1 1/4 2 1/2 3 3/4 4 Full	Base Area					Residential					Agricultural				
Construction		Base Area	Floor	Finished Living Area	Major Items					Improvement Features									
1 Frame or Aluminum 2 Stucco 3 Brick 4 Concrete Block 5 Metal 6 Concrete 7 Brick 8 Stone 9 Frame w/Masonry					C Concrete Floor E Electric Lights G Grade H Heating L Loft P Plumbing Q Living Quarters S Siding T Type of Construction					BARN T/S/L/P/E/I/D/Q Open Side Open Front T/P/E/C/I Slatted Floors Pits CRN CRB Frame/Wire Free-standing Drive-thru No. Roof No. Roof GRANARIES L Storage Bins Open Side GRAIN BINS - STEEL Diameter & Height or T/G/D OUSE BUILDINGS E/I/H Floor: Asphalt/Concrete SLURRY TANKS Round/Rectangular Round/Rectangular Plank Cover/No Cover SILO Concrete Conc. Slab/Reinfrd Masonry Tile/Conc. Blk./Brick Slatted Unreinf./Glass Lined No Roof TRENCH & BUNKER SLOS No. of Width									
SUMMARY OF RESIDENTIAL IMPROVEMENTS																			
ID	Use	Story Const. Height	Const. Type	Grade	Year Const.	Eff. Age	Cond.	Base Rate	Features	L/M	Adj. Rate	Size or Area	Replacement Cost	Total Degr.	Remainder Value	% Comp.	Inhd. Improvement Value		
01	Dwelling																		
O T E N																			
SUMMARY OF NON-RESIDENTIAL IMPROVEMENTS																			
ID	Use	Story Const. Height	Const. Type	Grade	Year Const.	Eff. Age	Cond.	Base Rate	Features	L/M	Adj. Rate	Size or Area	Replacement Cost	Total Degr.	Remainder Value	% Comp.	Inhd. Improvement Value		
01																			
Supplemental Card Residential Improvement Total																			
Total Residential Improvement Value																			
Supplemental Card Non-Residential Improvement Total																			
Total Non-Residential Improvement Value																			

Figure 3-8. Cells Used to Determine Row-Type Adjustments

Follow these guidelines to determine whether one or more property record cards must be completed for the row-type dwelling units:

- *If there are two or three units, the units have single ownership, the same square footage, and the same physical characteristics*, list and record the data, except exterior features, for one unit. The replacement cost of the building is computed by multiplying the cost of one unit by the number of units within the building.
- *If there are two or three units, the units have single ownership, different square footage or physical characteristics*, sketch, list, and record the data for each style unit on individual property record cards. The replacement cost of the building is computed by totaling the cost of all the units contained within the building.
- *If the units have individual ownership*, sketch, list, and record the data for each individual unit on a separate property record card. The replacement cost of each unit is calculated and assessed separately. This procedure applies to all individually owned platted row-type units regardless of the number of units contained within the structure. Such units are found in horizontal property regime or planned unit development properties.

Note: Single ownership wood joist buildings containing 4 or more row-type units are considered as commercial row-type structures and valued from the GCR apartment schedule.

To determine the adjustment for a row-type dwelling, use Schedule B and perform these steps:

- Step 1 In the wall type column, locate the row corresponding to the wall type of the dwelling.
- Step 2 Locate the column below the heading “Total Number of Units” that corresponds to the total number of units in the building.
- Step 3 Find the intersection of the selected row (wall type) and the selected column (number of units). Enter the number that you find in the “Row-type Adjustment” cell on the property record card.
- Step 4 Apply the adjustment for a row-type dwelling by multiplying the value in the “Total Base” cell by the value in the “Row-type Adjustment” cell and enter the result, rounded to the nearest \$10, in the “Sub-Total” cell.

Example: To determine the base price for an all brick row-type dwelling with 1,200 square feet, and two equally-sized units, first compute the base price of one unit. Then determine the adjustment using Schedule B. Locate the “Brick of Equal Wall Types” row and the “2” column. Find the intersection of the selected row and column, and enter the number that you find in the “Row-type Adjustment” cell on the property record card. Multiply the value in the “Total Base” cell by the value in the “Row-type Adjustment” cell and enter the result in the “Sub-Total” cell.

Task 3—Determining and Applying the Interior Feature Adjustments

Use Schedule C—Base Price Components and Adjustments, Schedule D—Plumbing and Built-ins, and Schedule E.1—Interior Features, provided in Appendix C, to determine any adjustments for interior features that need to be made to the dwelling's base price. .

Schedule C consists of two parts:

- deductions for an unfinished interior, no central heating, and no electrical service
- additions for central air conditioning, basement recreation room, and loft.

Schedule C includes prices for areas ranging from 100 to 5,000 square feet. Within this range, the price is listed in two different increments, depending on the area:

- For an area of 100 to 4,000 square feet, the prices are listed in intervals of 100 square feet.
- For an area of 4,000 to 5,000 square feet, the prices are listed in intervals of 1000 square feet.
- For an area over 5,000 square feet, extrapolation in 1,000 square foot increments is necessary. This is accomplished by finding the difference between 4,000 square feet and 5,000 square feet and applying that to each 1,000 square feet increment above 5,000 square feet.

Schedule D consists of three parts:

- additions and deductions for plumbing and number of fixtures
- additions for additional living units within the dwelling
- additions for specialty plumbing items.

Schedule E.1 includes additions for fireplaces.

Cells are provided on the Residential Property Record Card to determine the interior feature adjustments for the dwelling, as shown in Figure 3-9.

IMPROVEMENT DATA AND COMPUTATIONS									
Major Items					Improvement Features				
Residential					Agricultural				
C Concrete Floor D Dr/Floor E Electric Lights G Grade H Heating L Loft P Plumbing S Sewing Quarters T Type of Construction T Frame/Wire T Non-Standard Drive-thru T No. of Driveway T Floor GRANARIES Storage Bins Pole Type GRAIN BINS - STEEL Height & Height or Blended QUONSET BUILDINGS E/I/H Inground/above ground SURF PLANKS Round/Rectangular Round/Rectangular Inlaid Cover/No Cover SLO Conc. Slab/Reinfd Masonry Masonry Conc. Blk/Brick Steel Unreinf/Glass Lined V Ceramic/Plastic Filler Heater Non-rectangular Shape Enclosure Type TENNIS COURT Clay/Surf/Asphalt UT/SHED T/G					BARNs T/S/L/P/E/I/D/Q CONFINEMENT T/P/E/C/I Stalled Floors J CORR CRIB T Frame/Wire Non-Standard Drive-thru T Floor GRANARIES Storage Bins Pole Type GRAIN BINS - STEEL Height & Height or Blended QUONSET BUILDINGS E/I/H Inground/above ground SURF PLANKS Round/Rectangular Round/Rectangular Inlaid Cover/No Cover SLO Conc. Slab/Reinfd Masonry Masonry Conc. Blk/Brick Steel Unreinf/Glass Lined V Ceramic/Plastic Filler Heater Non-rectangular Shape Enclosure Type TENNIS COURT Clay/Surf/Asphalt UT/SHED T/G				
SUMMARY OF RESIDENTIAL IMPROVEMENTS ID Use Story Const. Height Grade Year Const. Age Eff Const. Age Cond. Base Rate Features L/M Adj. Rate Size or Area Replacement Cost Total Reimburse. Value % Nhd Improvement Value 01 Dwelling 02 03 04 05 06 07 Total Residential Improvement Value Supplemental Card Residential Improvement Total									
SUMMARY OF NON-RESIDENTIAL IMPROVEMENTS ID Use Story Const. Height Grade Year Const. Age Eff Const. Age Cond. Base Rate Features L/M Adj. Rate Size or Area Replacement Cost Normal Reimburse. Value Abnorm. Nhd Improvement Value 01 02 03 04 05 06 07 Total Residential Improvement Value Supplemental Card Non-Residential Improvement Total									

Figure 3-9. Cells Used to Determine the Interior Features Adjustments

To determine the interior feature adjustments to make to the base price for the dwelling, perform the following steps:

Step 1 *If the dwelling has an unfinished interior*, use Schedule C to determine the appropriate deduction from the base price for the dwelling

- a. *If the unfinished area is on the first story*, locate the row in the “Area” column corresponding to the square footage of the area with an unfinished interior on the first floor, if any.

Find the intersection of the selected row (area in square feet) and the “Full Story” column below the heading “Unfinished Interior”. Note the number that you find.

- b. *If the dwelling is a one and one-half story dwelling and there is unfinished area on the half story*, locate the row in the “Area” column corresponding to the square footage of the unfinished area on the half story.

Find the intersection of the selected row (area in square feet) and the “Half Story” column below the heading “Unfinished Interior”. Note the number that you find.

- c. *If the dwelling is a two-story dwelling and there is unfinished area on the second story*, locate the row in the “Area” column corresponding to the square footage of the unfinished area on the second story.

Find the intersection of the selected row (area in square feet) and the “Full Story” column below the heading “Unfinished Interior”. Note the number that you find.

- d. Sum the numbers found in Step a through Step c.
- e. Calculate the adjustment for an unfinished interior by multiplying the number found in Step d by \$100, and enter it in the “Unfinished Interior” cell.

Note: This deduction includes an adjustment for heating, so you do not need to make a separate deduction for heating.

Example 1: To determine the deduction for a bi-level, two-story dwelling with 300 square feet of unfinished interior on the lower level, locate the row for 300 in the “Area” column. Then note the number in this row for the “Full Story” column. Multiply the number by \$100.

Example 2: To determine the deduction for a one and one-half story dwelling with a ground floor base area of 1,000 square feet and an unfinished second floor, locate the row for 1,000 in the “Area” column. Then note the number in this row for the “Half Story” column. Multiply the number by \$100.

Example 3: To determine the deduction for a one and one-half story dwelling with a ground floor base area of 1,000 square feet with 50% of the second floor unfinished, determine that the unfinished area is 500 square feet ($1,000 \times .50 = 500$). Locate the row for 500 in the “Area” column. Then note the number in this row for the “Half Story” column. Multiply the number by \$100.

Step 2 *If the dwelling does not have a central heating system, use Schedule C to determine the appropriate deduction from the base price for the dwelling:*

Note: Central heating systems include forced air, electric baseboard, hot water, and steam heating systems. Types of systems not considered to be central heating systems are space heaters, wall furnaces, and gravity flow floor furnaces. The no central heating deduction also applies to a dwelling that has a solar or geothermal heating system as its sole source of heat. If a dwelling has a solar or geothermal heating system and a backup or reserve system, the no central heating deduction does not apply.

- a. In the “Area” column, locate the row corresponding to the square footage of the area without central heating on the first floor, if any.
Find the intersection of the selected row (area in square feet) and the “First Floor” column. Note the number that you find.
- b. *If the dwelling is a one and one-half story dwelling and there is space without central heating on the half story, locate the row in the “Area” column corresponding to the square footage of the area without central heating on the half story.*
Find the intersection of the selected row (area in square feet) and the “Half Upper” column below the heading “No Central Heating”. Note the number that you find.
- c. *If the dwelling is a two-story dwelling and there is space without central heating on the second story, locate the row in the “Area” column corresponding to the square footage of the area without central heating on the second story.*
Find the intersection of the selected row (area in square feet) and the “Full Upper” column. Note the number that you find.
- d. *If the dwelling has finished attic space without central heating, locate the row in the “Area” column corresponding to the amount of square footage used to calculate the finished attic.*
Find the intersection of the selected row (area in square feet) and the “Attic” column. Note the number that you find.
- e. Sum the numbers found in Step a through Step d.

- f. Calculate the adjustment for no central heating by multiplying the number found in Step e by \$100, and enter the amount in the “No Heating” cell on the property record card.

Example 1: To determine the deduction for a one and one-half story dwelling with a ground floor base area of 1,000 square feet, an upper floor the same size, and no central heating on either floor, first locate the row for 1,000 in the “Area” column (the area on the first floor with no central heating). Then note the number in this row for the “First Floor” column. Second, locate the row for 1,000 in the “Area” column (the area of the upper floor with no central heating). Then note the number in this row for the “Half Upper” column. Add the two numbers together and multiply their sum by \$100.

Example 2: To determine the deduction for a one and one-half story dwelling with a ground floor base area of 1,000 square feet, an upper floor the same size, and a central heating system on the first floor only, locate the row for 1,000 in the “Area” column (the area of the upper floor with no central heating). Then note the number in this row for the “Half Upper” column. Multiply the number by \$100.

Example 3: To determine the deduction for a partial one-story and partial two-story dwelling with a ground floor base area of 1,200 square feet, an upper floor of 800 square feet, and no central heating on either floor, first locate the row for 1,200 in the “Area” column (the area on the first floor with no central heating). Then note the number in this row for the “First Floor” column. Second, locate the row for 800 in the “Area” column (the area of the upper floor with no central heating). Then note the number in this row for the “Full Upper” column. Add the two numbers together and multiply their sum by \$100.

Example 4: To determine the deduction for a two-story dwelling with a ground floor base area of 1,000 square feet, a full finished attic, and no central heating system in the attic, locate the row for 1,000 in the “Area” column (the area of the upper floor with no central heating). Then note the number in this row for the “Attic” column. Multiply the number by \$100.

- Step 3 *If the dwelling does not have electrical service, use Schedule C to determine the appropriate deduction from the base price for the dwelling:*
- a. In the “Area” column, locate the row corresponding to the square footage of the area without electrical service on the first floor, if any. Find the intersection of the selected row (area in square feet) and the “First Floor” column. Note the number that you find.

- b. *If the dwelling is a two-story dwelling and there is no electrical service on the second story, locate the row in the “Area” column corresponding to the square footage of the second story.*

Find the intersection of the selected row (area in square feet) and the “Upper Floor” column. Note the number that you find.

- c. Sum the numbers found in Step a and Step b.
- d. Calculate the adjustment for no electrical service by multiplying the sum found in Step C by \$100, and enter the amount in the “No Electrical Service” cell on the property record card.

Step 4 *If the dwelling has a central air conditioning system, use Schedule C to determine the appropriate addition to the base price for the dwelling:*

- a. In the “Area” column, locate the row corresponding to the square footage of the area with central air conditioning on the first floor, if any.

Find the intersection of the selected row (area in square feet) and the “First Floor” column. Note the number that you find.

- b. *If the dwelling is a one and one-half-story dwelling and there is space with central air conditioning on the half story, locate the row in the “Area” column corresponding to the square footage of the area with central air conditioning on the half story.*

Find the intersection of the selected row (area in square feet) and the “Half Upper/Loft” column below the heading “Central Air Conditioning”. Note the number that you find.

- c. *If the dwelling is a two-story dwelling and there is space with central air conditioning on the second story, locate the row in the “Area” column corresponding to the square footage of the area with central air conditioning on the second story.*

Find the intersection of the selected row (area in square feet) and the “Full Upper” column. Note the number that you find.

- d. *If the dwelling has finished attic space with central air conditioning, locate the row in the “Area” column corresponding to the square footage of the area with central air conditioning in the attic.*

Find the intersection of the selected row (area in square feet) and the “Attic” column. Note the number that you find.

- e. Sum the numbers found in Step a through Step d.
- f. Calculate the adjustment for central air conditioning by multiplying the number found in Step e by \$100, and enter the amount in the “Air Conditioning” cell on the property record card.

Example 1: To determine the addition for a one and one-half story dwelling with a ground floor base area of 1,000 square feet, an upper floor the same size, and central air conditioning on both floors, first locate the row for 1,000 in the “Area” column (the area on the first floor with central air conditioning). Then note the number in this row for the “First Floor” column. Second, locate the row for 1000 in the “Area” column (the area of the upper floor with central air conditioning). Then note the number in this row for the “Half Upper” column. Add the two numbers together and multiply their sum by \$100.

Example 2: To determine the addition for a one and one-half story dwelling with a ground floor base area of 1,000 square feet, an upper floor the same size, and a central air conditioning system on the first floor only, locate the row for 1,000 in the “Area” column (the area of the first floor with central air conditioning). Then note the number in this row for the “First Floor” column. Multiply the number by \$100.

Example 3: To determine the addition for a tri-level dwelling with a ground floor base area of 1,200 square feet, a second floor of 950 square feet, and central air conditioning throughout, first locate the row for 1,200 in the “Area” column (the area on the first floor with central air conditioning). Then note the number in this row for the “First Floor” column under the heading “Central Air Conditioning”. Second, locate the row for 1,000 in the “Area” column (the entry in the table closest to the area of the upper floor with central air conditioning). Then note the number in this row for the “Full Upper” column. Add the two numbers together and multiply their sum by \$100.

- Step 5 *If the dwelling has a basement recreation room, use Schedule C to determine the appropriate addition to the base price for the dwelling:*
- In the “Area” column, locate the row corresponding to the square footage of the basement recreation room.
 - Locate the column below the heading “Basement Recreation Room” that corresponds to the type of the basement recreation room.
 - Find the intersection of the selected row (area in square feet) and the selected column (recreation room type). Note the number that you find.
 - Calculate the adjustment for a basement recreation room by multiplying the number found in Step c by \$100, and enter the amount in the “Rec. Room” cell.
- Step 6 *If the dwelling has a loft, use Schedule C to determine the appropriate addition to the base price for the dwelling:*

- a. In the “Area” column, locate the row corresponding to the square footage of the loft.
 - b. Locate the “Loft” column.
 - c. Find the intersection of the selected row (area in square feet) and the “Loft” column. Note the number that you find.
 - d. Calculate the adjustment for a loft by multiplying the number found in Step c by \$100, and enter the amount in the “Loft” cell.
- Step 7 *If the dwelling does not have plumbing, use Schedule D to determine the appropriate deduction:*
- a. Find the value that corresponds to “Deduct for no plumbing per living unit” and multiply it by \$100 to arrive at the dollar amount of the deduction.
 - b. Enter the result in the “No Plumbing” cell.
- Step 8 *If the dwelling has water service only, use Schedule D to determine the appropriate deduction:*
- a. Find the value that corresponds to “Deduct for water only” and multiply it by \$100 to arrive at the dollar amount of the deduction.
 - b. Enter the result in the “No Plumbing” cell.
- Step 9 *If the dwelling has more or fewer than five plumbing fixtures, use Schedule D to determine the appropriate addition or deduction:*
- a. In the “Plumbing” cell label, enter the dwelling’s total number of plumbing fixtures on the line to the right of “TF:”.
 - b. Subtract 5 from the total number of fixtures.
 - c. Calculate the adjustment by multiplying the number found in Step b by the per fixture cost.
- If there are specialty plumbing fixtures, note the result and perform Step 10.*
- Step 10 *If a bathtub has a jet or a steam conversion, or there is a sauna bath, steam bath, or whirlpool, use Schedule D to determine the appropriate addition:*
- a. Find the value corresponding to the type of specialty item and multiply it by \$100.
 - b. Add the result to the number found in Step 9c and enter the amount in the “Specialty Plumbing” cell.
- Step 11 *If there is an extra living unit in the dwelling, use Schedule D to determine the appropriate addition to the base price of the dwelling:*

- a. *If the living unit was originally designed as an individual family unit, find the value that corresponds to “Designed”.*
- b. *If the living unit was a space converted to accommodate an additional family, find the value that corresponds to “Conversion”.*
- c. Calculate the adjustment for an extra living unit by multiplying the appropriate value from Schedule D by \$100, and enter the amount in the “Extra Living Units” cell.

Step 12 *If the dwelling has fireplaces, use Schedule E.1 to determine the appropriate addition to the base price of the dwelling:*

- a. Locate the “First Opening” row and the column that best describes the fireplace type.
- b. Find the intersection of the selected row (first opening) and the selected column. Note the number that you find.
- c. *If there are any additional openings, locate the “Each Additional Opening” row and the column that best describes the fireplace type.*
- d. Find the intersection of the selected row and the selected column. Note the number that you find. Multiply the number by the amount of additional openings in the dwelling.
- e. Calculate the adjustment for fireplaces by summing the number for the first fireplace (found in Step b) and the number for any additional fireplace openings (found in Step d), and multiplying the result by \$100. Enter the result in the “Fireplace” cell.

Step 13 Locate the sub-total amount found in Task 1, Step 4 and apply the additions and deductions determined in Step 1 through Step 12 above. Enter the result in the “Sub-Total, One Unit” cell.

Step 14 *If the dwelling is a row-type dwelling, enter the number of units in the “Sub-Total, _Units” cell label. Multiply the number of units by the number in the “Sub-Total, One Unit” cell and enter the result in the “Sub-Total, Units” cell.*

Task 4—Determining and Applying the Exterior Features Adjustments

Use Schedule E.2—Garages & Carports and Schedule E.2—Exterior Features, provided in Appendix C, to determine the adjustments for exterior features that need to be made to the dwelling’s base price.

Cells are provided on the Residential Property Record Card to determine the exterior features adjustments for the dwelling, as shown in Figure 3-10.

IMPROVEMENT DATA AND COMPUTATIONS																			
Major Items					Improvement Features														
Residential					Agricultural														
C Concrete Floor D Dr/Floor E Electric Lights G Grade H Heating L Loft P Plumbing S Siding T Type of Construction					BARNS T/S/L/P/E/I/D/Q CONFINEMENT T/P/E/C/I Stalled Floors JES CORN CRIB Frame/Wire No Standing Drive-thru No Back Floor GRANARIES Storage Bins Pole Type GRAIN BINS - STEEL Height or Ribbed QUONSET BUILDINGS E/I/H In-ground/above ground SUPPLY TANKS Round/Rectangle Ribbed Covering SILO Conc. Slab/Reinfd Masonry Masonry, Conc. Blk./Brick Steel Unreinf/Glass Lined Y Ceramic/Plastic Heater Non-rectangular Shape TENNIS COURT Enclosure Type UTS/ASPHALT UT/G														
BOAT HOUSE T/G/D/Q Open Side A/G/H/D Open/Enclosed Back-to-back DETACHED GARAGE T/G/D/L/Q GREENHOUSE Free Standing Attached at End Lean-to ST/D/L SWIMMING POOL T Underwater Lighting Y Filter Heater Non-rectangular Shape TENNIS COURT Enclosure Type UTS/ASPHALT UT/G					BARN T/S/L/P/E/I/D/Q CONFINEMENT T/P/E/C/I Stalled Floors JES CORN CRIB Frame/Wire No Standing Drive-thru No Back Floor GRANARIES Storage Bins Pole Type GRAIN BINS - STEEL Height or Ribbed QUONSET BUILDINGS E/I/H In-ground/above ground SUPPLY TANKS Round/Rectangle Ribbed Covering SILO Conc. Slab/Reinfd Masonry Masonry, Conc. Blk./Brick Steel Unreinf/Glass Lined Y Ceramic/Plastic Heater Non-rectangular Shape TENNIS COURT Enclosure Type UTS/ASPHALT UT/G														
SUMMARY OF RESIDENTIAL IMPROVEMENTS																			
ID	Use	Story Height	Const. Type	Grade	Year Const.	Age	Eff. Age	Cont. Age	Base Rate	Features	L/M	Adj. Rate	Size or Area	Replacement Cost	Total Depr.	Remainder Value	% Comp	Nhhd Factor	Improvement Value
01	Dwelling																		
SUMMARY OF NON-RESIDENTIAL IMPROVEMENTS																			
ID	Use	Story Height	Const. Type	Grade	Year Const.	Age	Eff. Age	Cont. Age	Base Rate	Features	L/M	Adj. Rate	Size or Area	Replacement Cost	Total Depr.	Remainder Value	% Comp	Nhhd Factor	Improvement Value
01																			

Figure 3-10. Cells Used to Determine the Exterior Features Adjustments

To determine the exterior feature adjustment, perform the following steps:

Step 1 *If the dwelling has an attached, basement or integral garage, or an attached carport, use Schedule E.2—Garages & Carports and perform the following steps to determine the addition or deduction:*

Note: Detached garages and carports are considered residential yard structures and are valued in the “Summary of Improvements” section of the property record card. Additional information is provided in Chapter 5.

- a. Find the area of the garage to the nearest 50 square feet. It is not necessary to interpolate. Enter the area in the cell to the left of the garage type cell label on the property record card.
- b. Locate the row that corresponds to the garage type.
- c. Locate the column that corresponds to the area and car capacity of the garage.
- d. Find the intersection of the selected row (garage type) and the selected column (area in square feet and car capacity). Note the number that you find.

If the garage is larger than 1,200 square feet, first find the adjustment for 1,200 square feet. Then find the intersection of the selected row (garage type) and the “+50” column to determine the amount to add to that adjustment for each additional 50 square feet.

- e. Calculate the adjustment for a garage by multiplying the number found in Step d by \$100, and enter the amount in the appropriate cell in the Garages section of the property record card.

Step 2 *If the dwelling has an exterior feature such as a patio, canopy, portico, stoop, porch, bay window, deck, balcony, or solarium, use Schedule E.2—Exterior Features to determine the addition:*

- a. Locate the row that corresponds to the exterior feature.
- b. Locate the column that corresponds to the closest area of the exterior feature.
- c. Find the intersection of the selected row (exterior feature type) and the selected column (area in square feet). Note the number that you find.

If the feature is larger than 400 square feet, first find the adjustment for 400 square feet. Then find the intersection of the selected row and the “Per 100” column to determine the amount to add to that adjustment for each additional 100 square feet.

- d. Repeat Step a through Step c for each exterior feature. Add together the values found for all exterior features.

- e. Calculate the adjustment for exterior features by multiplying the sum found in Step d by \$100, and enter the amount in the “Exterior Features” cell on the property record card.

Step 3 Locate the sub-total amount found in Task 3, Step 13 or Step 14 and apply the additions and deductions determined in Step 1 and Step 2 above. Enter the result in the “Sub-Total” cell.

Task 5—Recording and Applying the Grade

The adjusted sub-total of a dwelling is the base price of the dwelling, adjusted to take into account any relevant features identified for the dwelling and the dwelling’s grade. Use Schedule F, provided in Appendix C, to determine the percentage adjustment to be made to the base price, based on the grade assignment. Cells are provided to record and apply the grade assigned to the dwelling and to determine the dwelling’s adjusted sub-total, as shown in Figure 3-11.

IMPROVEMENT DATA AND COMPUTATIONS																		
Major Items					Agricultural													
C Concrete Floor	D Dr. Floor	E Electric Lights	G Grade	H Heating	L Loft	P Plumbing	S Siding	T Type of Construction	BARN	T/S L/P E/I/D/Q								
Green Side	Open/Enclosed	Back-to-back	DETACHED GARAGE	T/G/D/L/Q	GREENHOUSE	Free Standing	Attached at End	Lean-to	STAIRS	CONCRETE								
BOAT HOUSE	T/G/D/Q	GRAIN BINS - STEEL	QUONSET BUILDINGS	E/I/H	SUPPLY YANIS	Round/Rectangle	SILOS	Conc. Slab/Reinfd	Masonry	Unreinf/Glass Lined								
GRANARIES	Storage Bins	Blameat & Height or	QUONSET BUILDINGS	E/I/H	SUPPLY YANIS	Round/Rectangle	SILOS	Conc. Slab/Reinfd	Masonry	Unreinf/Glass Lined								
BOAT HOUSE	T/G/D/Q	GRAIN BINS - STEEL	QUONSET BUILDINGS	E/I/H	SUPPLY YANIS	Round/Rectangle	SILOS	Conc. Slab/Reinfd	Masonry	Unreinf/Glass Lined								
GRANARIES	Storage Bins	Blameat & Height or	QUONSET BUILDINGS	E/I/H	SUPPLY YANIS	Round/Rectangle	SILOS	Conc. Slab/Reinfd	Masonry	Unreinf/Glass Lined								
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SUMMARY OF RESIDENTIAL IMPROVEMENTS																		
ID	Use	Story Height	Const. Type	Grade	Year Const.	Age	Eff. Age	Cond.	Base Rate	Features	L/M	Adj. Rate	Size or Area	Replacement Cost	Remainder Value	% Comp	Nhhd Factor	Improvement Value
01	Dwelling																	
O T E N																		
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01																		

Figure 3-11. Cells Used to Record the Grade and Location Multiplier to Calculate the Replacement Cost

To determine the grade adjustment and to calculate the adjusted sub-total of the dwelling, perform the following steps:

- Step 1 Next to the “Grade and Design Factor” cell label on the property record card, enter the letter grade assigned to the dwelling. Information about determining the grade for a dwelling is provided in Appendix A.
- Step 2 In the “Grade and Design Factor” cell, enter the grade factor percentage corresponding to the dwelling’s grade. Instructions for determining the grade factor percentage for a dwelling using Schedule F are provided in the section *Assigning Grades to Dwelling Units* in Appendix A.
- Step 3 Divide the grade factor percentage corresponding to the dwelling’s grade by 100 to arrive at a multiplier.
- Step 4 Calculate the dwelling’s adjusted sub-total by multiplying the amount in the “Sub-Total” cell (entered in Task 4, Step 3) by the multiplier obtained in Step 3. Enter the result in the “Adjusted Sub-Total” cell.

Task 6—Determining and Applying the Location Cost Multiplier

The cell labeled “Location Multiplier” is used to make an adjustment to the costs found in Appendix C. Due to the fact that costs are relative to location, we have included location cost multipliers, by county, to account for these differences. The table indicating the multiplier for your county and a more detailed explanation of location cost multipliers can be found in Appendix C.

- Step 1 Locate the multiplier in Table C-1 for your county.
- Step 2 Place the multiplier from Table C-1 in the “Location Multiplier” cell on the property record card.
- Step 3 Calculate the adjustment for location by multiplying the location cost multiplier by the “Adj. Sub Total” cell.
- Step 4 Place the product of Step 3 in the “Replacement Cost” cell, rounded to the nearest \$10.

Completing the Summary of Residential Improvements Section

The “Summary of Residential Improvements” section of the property record card, shown in Figure 3-12, provides space to record information about:

- the dwelling
- a detached garage (if it is the sole garage)
- improvements to the dwelling during non-reassessment years.

The addition schedule is designed to value stick-built room additions to mobile and manufactured homes during the general reassessment and to value room additions to dwellings in the interim years between general reassessment years. Room additions added to existing dwellings before March 2, 2011, must be

calculated as part of the original structure and depreciated based on the age or the effective age in combination with the main structure.

The addition schedule is divided into three distinct sections depending on the type of addition constructed. Each section is based on the square footage of the addition and the type of construction. The sections are interpreted as follows:

- **Three-wall addition attached at one end.** An addition in which the common wall between the dwelling and the room addition is the smallest dimension of a rectangular structure.
- **Three-wall addition attached at one side.** An addition in which the common wall between the dwelling and the room addition is either the longest dimension of a rectangular structure or one side of a square structure.
- **Two-wall addition.** An addition in which only two walls are needed to enclose the structure.

Each section lists either frame or masonry type walls with values to be added for additions that contain half or full upper stories, basements, or crawl spaces. The schedule is similar to other schedules in that the construction type and square footage of the addition must be known to arrive at the base cost. Adjustments to this cost are made using Schedule A, Schedule C, Schedule D (to add for plumbing), Schedule E, and Schedule F.

This section describes how to complete the “Summary of Residential Improvements” section for a dwelling. Enter the information for the dwelling in the “01 Dwelling” row.

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Figure 3-12. Summary of Residential Improvements Section

To complete the “Summary of Residential Improvements” section for the dwelling, perform these steps:

- Step 1 In the “Story Height” column, enter the story height of the dwelling as it appears in the sketch grid.
- Step 2 In the “Year Const.” column, indicate when the dwelling was originally constructed. Follow these guidelines:
- *If you are sure of the date*, enter just the date, for example “1990”.
 - *If you (the assessor) must estimate the date*, enter the date followed by a question mark, for example “1985?”.
 - *If the owner estimates the date*, enter the date followed by “+/-”, (for example “1985+/-”).
 - *If the dwelling was constructed prior to 1941*, enter “Old”.
- Step 3 In the “Cond.” column, enter the code indicating the assigned condition rating of the dwelling. Table 3-12 describes the codes for this column. For information on assigning the condition rating, see Appendix B.

Table 3-12. Condition Ratings

CONDITION RATING	EXPLANATION OF CHARACTERISTICS
Excellent	The structure is in near perfect condition. It is very attractive and is highly desirable. It meets all current design requirements as set forth by the buyers and sellers in the market. Generally, any item that could be or would be normally repaired or refurbished has been corrected. There are generally no functional inadequacies of any consequence and all of the short-lived items are in like new condition.
Good	Minor deterioration visible in the building. It is more attractive and more desirable than the average building of its chronological age. Generally, all items are well maintained and many of them have been overhauled and repaired as they have shown signs of wear. There is very little deterioration or obsolescence evident and there is a high degree of functional utility in the parcel and in the structure.
Average	Normal wear and tear is apparent in the building. It has average attractiveness and desirability. There are typically minor repairs that are needed along with some refinishing. In this condition, most of the major components are still viable and are contributing to the overall utility and value of the property.
Fair	Marked deterioration is evident in the structure. It is rather unattractive or undesirable but still quite useful. This condition indicates that there are a substantial number of repairs that are needed. Many items need to be refurbished, overhauled, or improved. There is deferred maintenance that is obvious.
Poor	Definite deterioration is obvious in the structure. It is definitely undesirable or

	barely useable. Extensive repair and maintenance are needed on painted surfaces, the roof, and the plumbing and heating systems. There may be some functional inadequacies or substandard utilities. There is extensive deferred maintenance.
Very Poor	Conditions in the structure render it unusable. It is extremely unfit for human habitation or use. There is extremely limited market value in use and it is approaching abandonment. The structure needs major reconstruction to have any effective economic value.

Note: Instructions for determining the condition rating for a dwelling are provided in Appendix B.

Step 4 In the “Replacement Cost” cell, enter the replacement cost calculated for the dwelling (also entered in the “Replacement Cost” cell in Task 6, Step 4), rounded to the nearest \$10.

Step 5 In the “Total Depr.” column, enter the percentage of reduction in value due to total depreciation. Information about determining total depreciation for a dwelling is provided in Appendix B.

Step 6 Determine the remainder value:

- a. Subtract the percentage determined for total depreciation (entered in the “Total Depr.” column) from 100%.
- b. Divide the result obtained in Step a by 100 to arrive at a multiplier.
- c. Calculate the remainder value by multiplying the replacement cost of the structure (entered in the “Replacement Cost” column) by the multiplier obtained in Step b:

$$\begin{array}{rcccl} \text{Remainder} & = & \text{Replacement} & \times & \text{Multiplier} \\ \text{value} & & \text{cost} & & \text{obtained} \\ & & & & \text{in Step b} \end{array}$$

- d. Enter the remainder value in the “Remainder Value” column, rounded to the nearest \$10.

Example: The replacement cost of a dwelling is \$80,000. The total depreciation percentage for the dwelling is 30%. The remainder value is: $100\% - 30\% = 70\% \div 100 = .70 \times \$80,000 = \$56,000$.

- Step 7 If the improvement being valued is less than 100% complete on the assessment date, enter the percentage complete in the “% Comp” cell. Information on percentage completion can be found in Appendix C.
- Step 8 Calculate the neighborhood factor and enter the result in the “Nhbd Factor” cell. Information on neighborhood factors can be found in Appendix B.
- Step 9 The improvement value is the remainder value of the dwelling, adjusted for % complete and neighborhood factor (if necessary), rounded to the nearest \$100. Enter this amount in the “Improvement Value” column on the property record card.
- Step 10 *If the property has a detached garage (secondary to an attached garage), yard structures, or other improvements to describe, follow the instructions in Chapter 5 to complete the “Summary of Non-Residential Improvements” section.*

Note: If the property has a detached garage as it’s only garage it must be valued as a residential improvement in order to receive the homestead credit (if applicable).

If the property has no other improvements to describe, sum the entries in the “Improvement Value” column and enter the total in the “Total Residential Improvement Value” cell.

Solar Heating and Cooling Systems

This section describes identifying and valuing solar energy heating and cooling systems that are valued as real property improvements or as personal property mobile homes that are assessed on an annual basis. Any qualifying solar energy heating and cooling systems valued from the cost schedules in Appendix C of this book or Appendix G in Book 2 are eligible for an assessed valuation deduction as prescribed in IC 6-1.1-12-26. To qualify as a solar energy heating and cooling system, the system must contain a collection unit, a storage medium, and a distribution unit. A passive solar system **does not** qualify as a solar energy heating or cooling system.

Solar Heating and Cooling System Definitions

The following definitions are associated with solar energy heating and cooling systems.

air system

A qualifying system that uses various gases as the transfer agent between the solar collection unit and the storage medium. Normally, this type of system uses pebbles and rocks as the storage medium.

Control devices	All switches and wiring necessary to operate the solar system.
depreciation date	March 1, 2011
energy transfer equipment	The equipment that transfers thermal energy from the collection source to the storage medium.
insulated containment vessel	The apparatus that insulates the storage medium from its surroundings to limit the loss of energy.
liquid system	A qualifying system that uses a liquid as the transfer agent between the solar collector unit and the storage medium. Normally this type system uses a liquid storage tank as the storage medium.
passive solar system	A greenhouse type enclosure that does not meet the qualification standards of a collection unit, a storage medium, and a distribution unit.
solar collector	An assembly or structure designed to gather, concentrate, or absorb direct and indirect solar energy.
solar distribution unit	The portion of the solar unit that distributes the final product to its destination. Items normally associated with the solar distribution units are: <ul style="list-style-type: none"> ■ ductwork ■ fans ■ heat exchangers ■ pumps ■ plumbing necessary to interconnect the solar system.
solar medium	The material in which energy is stored.

Solar Heating and Cooling System Types

Table 3-13 lists the types of solar heating and cooling systems.

Table 3-13. Solar Heating and Cooling Systems

This type	Indicates
Type A	A solar collection unit of thirty (30) square feet, a storage medium consisting of either a one hundred twenty (120) gallon tank for a liquid system or a storage vessel with a rock surface area of four hundred (400) square feet for an air system, and an elaborate contractor installed distribution unit that requires minimum occupant

	involvement on a day-to-day basis. This type of system virtually runs itself through the use of sophisticated monitoring equipment. This type of system is normally designed for and incorporated into the structure at the time of construction.
Type B	A solar collection unit of twenty-five (25) square feet, a storage medium consisting of either an eighty (80) gallon tank for a liquid system or a storage vessel with a rock surface area of three hundred (300) square feet for an air system, and a contractor installed distribution unit that requires limited occupant involvement in the day-to-day operation of the system.
Type C	A solar collection unit of twenty (20) square feet, a storage medium consisting of either a sixty (60) gallon tank for a liquid system or a storage vessel with a rock surface area of two hundred (200) square feet for an air system, and a contractor installed distribution unit that relies on the occupant to make internal adjustments within the system during the day-to-day operation of the system.
Type D	A homemade solar collection unit of less than twenty (20) square feet and a storage medium of either a forty (40) gallon tank for a liquid system or a storage vessel with a rock surface area of two hundred (200) square feet or less for an air system. The Type D system uses the structure's existing base heating and cooling system as the distribution unit for the system. The Type D distribution unit's cost included in the cost schedules reflect the additional cost incurred to hook-up the solar portion of the system to the base heating system included in the structure's calculation of replacement cost.

Collecting Data for Solar Systems

The solar heating and cooling system cost schedules contain rates for a collection unit, a distribution unit, and a storage medium. The general reassessment has identified the structures that contain a solar heating and cooling system. The solar cost schedules in Appendix C pertain to the pricing of a solar system that is separate from the base heating system. It is important to remember that structures containing a base or reserve heating system and a separate solar system must be charged for both systems. A solar heating and cooling system that uses the distribution unit of an existing base heating system is charged for only those components that are necessary to make the system a solar system.

A qualifying solar heating and cooling system must have a collection unit, a storage medium, and a distribution unit. The basic principle of a solar system is to collect the sun's energy as heat, transfer this heat to a specific medium for storage, and disperse the heat throughout a structure at a future time for the comfort of the occupants. There are two basic types of solar systems:

- A **liquid solar system** uses liquid as the transfer agent between the various components of the system. The solar collection unit, normally located on the roof of the structure, is connected to the remainder of the system by a series of pipes. The liquid contained within the system is pumped through the collection unit where heat collected from the sun's rays is transferred to the liquid. This heated liquid is periodically pumped to the storage medium—an insulated storage tank in a liquid system. As the liquid is pumped through a heat exchanger, which removes heat from the liquid, the heat is transferred to air or water for distribution throughout the structure.
- An **air system** operates in a similar manner to a liquid system but the transfer agent is warm air and the storage medium is pebbles or rocks. Through the use of a system of pipes, air is blown through the collection unit where heat is transferred to the air. The heated air is blown through a series of pipes to the storage vessel that contains pebbles or rocks. Heat, transferred to the rocks from the circulated air, is stored within the rocks for future use. This heat is then transferred to either air or water by a series of pipes for distribution throughout the structure.

Collecting Data for Residential Solar Energy Systems

The cost schedules for residential solar systems in Appendix C contain base rates for an independent system and the component costs that make up the independent system. The schedules are arranged to value the system either as a system type or to value the various components when identified by the type of components. When collecting data for a solar heating and cooling system, you must select a valuation method and record the method in the “Summary of Improvements” section of the property record card:

- *If the solar system is being valued on a **system basis***, record the system type in the “Use” column and the type of storage medium in the “Construction” column.
- *If the solar system is being valued on an **individual component basis***, record each type of collection unit, distribution unit, and the type of storage medium, including the variables of either liquid or rock, as separate line entries within the section.

Collecting Data for Commercial Solar Energy Systems

For commercial solar energy systems, the principle factor necessary in data collection is the total surface square foot area of the system's collection unit. The applicable square foot rate includes all equipment associated with the system. To identify the system in the “Summary of Improvements” section of the Commercial

and Industrial property record card, you must record “Com. solar system” in the “Use” column and the total square foot area of the collection unit in the “Size” column.

Pricing Solar Systems

Pricing of Residential Solar Systems

A residential solar system or the individual components of a residential solar system must be valued as real property in the “Summary of Improvements” section of the Property Record Card’s “Summary of Improvement” section:

- *If the pricing is on a **system basis***, record only the type of system as an individual line entry. For example, record “Type A solar system” in the “Use” column, the codes, “Liq” or “Roc” in the “Construction Type” column, and the corresponding base rate for the type of system identified in the “Base Rate” column. Then multiply the “Base Rate” times the location multiplier and enter the result in the “Adjusted Rate”, and “Replacement Cost” columns.
- *If the pricing is on a **component basis***, record each type of component as an individual line entry. For example, to record the system components:
 - In the first available row in the “Summary of Improvements” section, record “Type B collector” in the “Use” column with the corresponding component rate appearing in the “Base Rate” column. Then multiply the “Base Rate” times the location multiplier and enter the result in the “Adjusted Rate”, and “Replacement Cost” columns.
 - In the next row, record “Type C storage medium” in the “Use” column, the codes “Liq” or “Roc” in the “Construction Type” column, and the corresponding rates in the “Base Rate” column. Then multiply the “Base Rate” times the location multiplier and enter the result in the “Adjusted Rate”, and “Replacement Cost” columns.
 - In the next row, record “Type C distribution unit” in the “Use” column and the corresponding component rate in the “Base Rate”. Then multiply the “Base Rate” times the location multiplier and enter the result in the “Adjusted Rate”, and “Replacement Cost” columns.

Pricing Commercial Solar Systems

To calculate the value of a commercial solar system, identify the total square footage of the system’s collection unit and multiply that square footage by the applicable base rate (adjusted for location) identified in the cost schedule in Appendix G. Select the rate that is closest to the subject’s square footage. Do not interpolate between rates.

Depreciating Solar Systems

Depreciating Residential Solar Systems

Use the Residential Dwelling Depreciation Table for the appropriate grade found in Appendix B to adjust the replacement cost of a residential solar system. These depreciation tables are based on age and condition. The age of the system will be unique for each separate system.

- Age is determined by finding the difference between the year of construction of the solar system and the depreciation date, defined earlier in this section.
- Condition is the same as the dwelling that it serves.

Depreciating Commercial Solar Systems

Use Chart 3 found in Appendix F to adjust the replacement cost of a commercial solar system. This table combines the variables of age and condition to arrive at the normal depreciation percentage for the system. The condition ratings and age variables of the system are judged in the same manner as for a residential system.

Geothermal Heating and Cooling Systems

This section provides instructions for identifying and valuing geothermal heating and cooling systems that are valued as real property improvements. Any qualifying geothermal heating and cooling system valued from Appendix C in this book and Appendix G in Book 2 is eligible for an assessed valuation deduction as prescribed in IC 6-1.1-12-34. To qualify for a deduction under IC 6-1.1-12-34, a geothermal heating and cooling device must be certified by the Indiana Department of Environmental Management as prescribed in IC 6-1.1-12-35.5.

Geothermal Heating and Cooling System Definitions

The following definitions are associated with geothermal systems.

closed loop system	A geothermal heat pump system that uses a continuous sealed loop of buried plastic pipe as the heat exchanger. Loops can be buried horizontally or vertically.
geothermal heat pump	An electrically powered device that uses the natural heat storage ability of the earth or the earth's ground water to heat or cool a structure.

geothermal heating and cooling device	A device that was installed after December 31, 1981 and designed to use the natural heat cooling device from the earth to provide hot water, produce electricity, or generate heating and cooling.
heat exchanger	A device designed to transfer heat between two (2) physically separated fluids or mediums of different temperatures.
liquid medium	Ground water or an acceptable antifreeze solution.
open loop system	A geothermal heat pump system that uses ground water from a conventional water well as the heat source for the system. The water is returned to the environment as either open discharge or a return well.

Geothermal Heating and Cooling System Types

The geothermal heating and cooling system cost schedules contain rates for both closed loop and open loop geothermal systems:

- **“Closed loop”** system is a geothermal heating and cooling system that uses a continuous loop of special pipe that is buried in the ground or sunken into a pond or river. This pipe, that contains a liquid medium of a pressurized antifreeze solution, is connected to the indoor geothermal heat pump to form a sealed, underground loop. The antifreeze solution is circulated throughout the loop where low temperature heat is transferred from the ground or water to the antifreeze solution. This low temperature heat is used by the geothermal heat pump to warm the refrigerant within the unit. The two (2) variations of a closed loop system are:
 - **Horizontal** loop systems consist of a series of trenches that are dug throughout the land surrounding the structure. These trenches are normally four (4) to six (6) feet deep and up to four hundred (400) feet long, depending upon how many pipes are located within the trench. The normal placement of pipe within the trench is to install a run of pipe at the five (5) foot level and cover it up with dirt. At the three (3) foot level of the trench, a second run of pipe is looped back over the first run and another layer of soil is added to fill-in the trench. This overlapping method allows more length of pipe to be used per linear foot of excavated trench. As a general rule for horizontal loop systems, it requires approximately five hundred (500) to six hundred (600) linear feet of underground piping to service one (1) ton of system capacity.
 - **“Vertical”** loop systems are similar to horizontal loop systems except that the loop is installed downward instead of horizontally throughout the yard. In a vertical loop, holes are bored into the ground and U-shaped loops of pipes are inserted into the holes. After the installation of the system is

complete, the created holes are backfilled with a sealing solution. As a general rule for vertical loop systems, it requires approximately one hundred twenty five (125) to one hundred fifty (150) linear feet of underground piping to service one (1) ton of system capacity.

- **Open loop** system is a geothermal heating and cooling system that uses ground water from a conventional well as the heat source for the system. The water is pumped into the geothermal heat pump unit where heat is extracted. The extracted heat is used by the heat exchanger to warm the refrigerant with the unit. This extracted heat is used by the heat exchanger to warm the refrigerant within the unit. After the water has passed through the geothermal heat pump unit, it is discharged in one (1) of the following ways:
 - The **open discharge system** simply involves releasing the water into a river, stream, pond, ditch, or drainage tile.
 - The **return well system** involves the drilling of a second well that is used to return the ground water to the ground aquifer.

Many geothermal heat pump units are equipped with an internal auxiliary electric heat plant to ensure that the heat is sufficient during periods of repair or extremely cold weather. The unit is designed as an integral part of a geothermal heating and cooling system, and the presence of this small auxiliary heat plant within the geothermal heat pump unit does not alter the qualifications for a deduction as a geothermal heating and cooling device.

Certain types of geothermal heat pump units are installed in conjunction with existing fossil fuel furnaces located within a structure. These types of configurations are commonly referred to as split systems. The geothermal heat pump unit uses the existing furnace's distribution system to distribute hot and cold air throughout the structure. The geothermal portion of a split system may qualify for the geothermal deduction under IC 6-1.1-12-34. However, the structure's base furnace and its distribution system shall be valued and assessed as part of the real property assessment. The "no heat" adjustment for geothermal heating described in Chapter 3 does not apply for a split system. If a split system exists in a particular structure, the applicable rates to value the geothermal portion of the system are taken from the cost schedules labeled "without distribution system".

Collecting Data for Geothermal Systems

The technology associated with a geothermal heating and cooling system is based on the same principles as a standard air heat pump furnace. Both types of systems rely on a process of elevating the low temperature heat acquired from the environment and transferring it indoors through a cycle of evaporation, compression, condensation, and expansion of a refrigerant gas contained within the heat pump unit.

The geothermal heating cycle begins as a cold, liquid refrigerant that passes through the heat exchanger and absorbs heat from the low temperature liquid medium. The refrigerant evaporates into a gas as heat is absorbed, and the gaseous refrigerant passes through a compressor that pressurizes it.

Pressurization of the refrigerant raises its temperature in excess of one hundred eighty (180) degrees and the hot gas is circulated through a refrigerant-to-air heat exchanger where the heat is removed and pumped into the structure. As a result of this interaction, the gas begins to cool which causes it to liquefy and the heating cycle begins again. The cooling cycle is the reverse of the heating cycle where the structure's heat is transferred to the liquid medium and the cold refrigerant passes through the refrigerant-to-air exchanger that provides cool air.

Data Collections Codes for Geothermal Systems

Table 3-14. Data Collection Codes for Geothermal Systems

This code	Indicates
HCLSWD	A horizontal closed loop system with a distribution system.
HCLSWOD	A horizontal closed loop system without a distribution system.
VCLSWD	A vertical closed loop system with a distribution system.
VCLSWOD	A vertical closed loop system without a distribution system.
ODOLSWD	An open discharge open loop system with a distribution system.
ODOLSWOD	An open discharge open loop system without a distribution system.
RWOLSWD	A return well open loop system with a distribution system.
RWOLSWOD	A return well open loop system without a distribution system.

Tonnage Ratings for Geothermal Systems

In addition to collecting data about the type of geothermal system installed in a particular structure, the assessor also must collect data about the rated tonnage of the system.

Tonnage is the accepted measure for size used throughout the heating and cooling industry. The specific tonnage rating of a system indicates the system is capable of efficiently heating and cooling a certain amount of square foot area. The larger the amount of square footage to be heated and cooled in a structure dictates a larger tonnage amount required for the system.

As a general guideline, one (1) ton of geothermal heating and cooling is needed to service approximately six hundred (600) to seven hundred (700) square feet of structure. This general guideline is dependent on the individual structure, and it's

history of measured heat loss and gain before the installation of the geothermal system. The cost schedules in Appendix C include the following tonnage ratings:

- two (2) tons
- two and five-tenths (2.5) tons
- three tons (3)
- three and five-tenths (3.5) tons
- four (4) tons
- five (5) tons
- six (6) tons

Structures With Two or More Geothermal Systems

In certain instances, a structure could contain two (2) or more separate geothermal heating and cooling systems. This normally occurs when a structure contains a very large amount of square footage or there is a limited amount of yard area to support a complex closed loop geothermal system. The data collection procedures are as follows:

- If a structure contains two (2) or more separate geothermal heating and cooling systems and shares the same distribution system throughout the structure, record the largest rated tonnage system as having the distribution system and the remaining system or systems as having no distribution system.

Example: A structure has two (2) separate horizontal closed loop geothermal systems. The first system is rated at four (4) tons and the second is rated at two (2) tons. When collecting data, the assessor must list the four (4) ton system as a horizontal closed loop system with distribution, “HCLSWD”, and the second system as a horizontal closed loop system without distribution, “HCLSWOD”.

- For structures that contain two (2) or more separate geothermal heating and cooling systems with their own distribution systems, list both systems separately as having distribution systems.

Example: There are two (2) separate horizontal closed loop systems. Both systems are rated at three (3) tons. The assessor must list both systems separately as a horizontal closed loop system with distribution, “HCLSWD”.

Note: Data for geothermal heating and cooling systems used in commercial structures must be collected and priced in the same manner as comparable residential systems.

Pricing Geothermal Systems

The cost schedules for pricing geothermal heating and cooling systems in Appendix C are formatted by type of system, tonnage rating of the system, and whether the system maintains a separate distribution system.

The correct system pricing is obtained by selecting the geothermal system type as either horizontal closed loop, vertical closed loop, open discharge open loop, or return well open loop, selecting the system's rated tonnage size, and selecting the appropriate base rate (adjusted for location) from either the "w/ distribution" column or the "w/o distribution" column.

Depreciating Geothermal Systems

Depreciating Residential Geothermal Systems

Use the Residential Dwelling Depreciation Table for the appropriate grade found in Appendix B to adjust the replacement cost of geothermal heating and cooling systems. These depreciation tables rely on the variables of age and condition.

The age of the system will be unique for each separate system.

- Age is determined by finding the difference between the year of construction of the geothermal system and the depreciation date as defined earlier in this section.
- Condition is the same as the dwelling it serves.

Depreciating Commercial Geothermal Systems

Use Chart 3 found in Appendix F to adjust the replacement cost of a commercial geothermal heating and cooling system. This table combines age and condition to determine the normal depreciation percentage for the system. The condition ratings and age variables of the system are determined in the same manner as for general geothermal heating and cooling systems, described earlier.